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DRIFT DATA ACQUIRED ON MECHANICAL SALT WATER COOLING DEVICES

GUNTER O. SCHRECKER, ET AL

ENVIRONMENTAL SYSTEMS CORPORATION
KNOXVILLE, TENNESSEE

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16. ABSTRACT The report gives test data from drift characterization and airborne salt monitoring studies conducted on and around a single-cell, mechanical-draft salt-water cooling tower and two spray modules at Turkey Point, Florida. Source measurements of drift droplet size distributions and mineral mass emissions were conducted for both devices during a winter test and for the tower alone during a summer test. Atmospheric salt concentrations and depositions were measured for 11 months, both with and without cooling device operation. Cooling tower drift droplet measurements yielded a drift emission fraction of 0.00027% of the water flow rate of 1260 kg/s, and a droplet mass median diameter of 120 micrometers. The average mineral mass emission rate was 0.00083% of the minerals circulating as solute in the cooling water. Droplet size spectra and mineral mass fluxes of the spray module drift emission were measured up to a height of 11 m above water level, below which the bulk of the drift was observed, and downwind to a distance of 88 m.

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Air Pollution	Air Pollution Control	13B
Cooling Towers	Stationary Sources	13A, 07A
Salt Water	Spray Modules	08J
Salt Spray Tests	Drift Data	14B
Drops (Liquids)	Mineral Content	07D
Size Determination	Emission Rate	

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SECTION I

SUMMARY

This contract was directed towards the acquisition of data on the drift emission from a single cell mechanical draft cooling tower and two spray modules and the measurement of airborne salt loadings in the vicinity of these cooling devices up to a distance of about 2 km. The airborne salt loadings were measured before the cooling devices became operational and later during the operation of either the cooling tower or the two spray modules. The test was executed at Florida Power and Light Company's (FP&L) Turkey Point electric power generation plant which is located about 50 km (30 miles) south of Miami at the shore of Biscayne Bay.

For condenser cooling this plant uses a closed-cycle system of shallow canals which dissipates the heat to the atmosphere primarily by surface evaporation. The two spray modules were installed into this canal system, and the cooling tower was erected at its shore for the purpose of these measurements. The tower received the hot water from the cooling canal system and discharged the cold water back into it.

Drift measurements were conducted on both cooling devices during the winter test phase which lasted from January 21 to March 31, 1974, and again on the cooling tower during the summer test phase from July 16 to 24, 1974.

The drift instrumentation package consisted of a PILLS II-A instrument (Particulate Instrumentation by Laser Light Scattering) and a Sensitive Paper (SP) machine, both of which counted and sized drift droplets, an isokinetic (IK) sampling tube which measured the mineral mass flux, a propeller anemometer for air speed measurements, and an electronic psychrometer.

During the cooling tower test the inlet and outlet water temperatures and the water levels in the hot water basins were monitored. The canal water temperature was monitored during the spray module test. A 10 m tall meteorological tower, located within 50 m of both cooling devices, provided data during most of the winter test phase and during the summer test phase. Canal water concentrations of sodium and magnesium were monitored during both testing phases.

Cooling tower drift data were acquired along five fan stack exit diameter traverses, with 12 to 16 data points per traverse. Each data point was usually comprised of a drift droplet size spectrum, sodium and magnesium mass fluxes, air updraft velocity, exhaust air temperature, and tower operational and meteorological data. The range of measured droplet diameters was 10 to 2240 μm. At 85% of all measurement positions the number of counted and sized droplets was sufficient to allow the determination of the droplet size spectrum in the diameter range of 10 to 600 μm; at the remaining 15% the upper limit of the diameter range was between 300 and 550 μm. Droplets with diameters larger than 600 μm were measured at about 30% of all measurement positions. However, since typically one or two, but never more than three, of such large droplets were encountered at any one of those positions, the number of droplets was too small to include them into the droplet size spectra.

A cooling tower composite drift droplet size spectrum was calculated from all spectra obtained along the diameter traverses. The composite spectrum is representative of the drift droplet emission encountered under the meteorological conditions and tower operational parameters existent during the winter and summer test phases. The mass median diameter of the composite droplet size spectrum was 120 μm, and the drift droplet mass emission calculated from the composite droplet size spectrum was 0.00027% of the water flow rate of 1,260 kg/s (20,000 gpm). This percentage value is commonly referred to as the drift fraction.

The mineral mass emission fraction was calculated for each of the five diameter traverses from the mineral mass fluxes obtained at each measurement position. This parameter expresses the rate of mineral mass emission as a percentage of the rate of mineral mass circulating through the tower as solute in the cooling water. The average mineral mass emission fraction of all five diameter traverses was 0.00083%. This number takes into account that the water flow rate was 1,260 kg/s (or 20,000 gpm) during the winter test phase, but only 970 kg/s (or 15,400 gpm) during the summer test phase.

During the spray module drift emission test a barge was used as instrumentation carrier. Since all support equipment including the power supply were on board, it was able to move freely on the canal system that harbored the floating spray modules. The drift instrumentation package contained the same instruments as mentioned before. The propeller anemometer, however, measured the wind speed instead of air updraft speed. Also, a wind vane was added to the instrument package in order to measure the relative wind direction with respect to the barge's center line. The barge supported a tower which allowed the positioning of the instrument package anywhere between 1 m and 11 m above water level.

The spray module test yielded drift emission data, i.e. the drift droplet size spectrum and mineral mass flux, together with meteorological data, at selected points in space downwind of the spray modules. Thirty-eight data points were obtained at various downwind distances between 21 m and 88 m and heights between 2.4 m and 11 m. About 50% of the data were measured at a height between 4.3 m and 4.6 m which was slightly above the spray umbrella height of about 4.1 m. The range of measured droplet diameters was between 10 μm and, in the average, 300 μm. The upper limit varied between 200 and 500 μm, primarily due to wind speed and distance from the spray modules.

Whereas the data obtained in the cooling tower's stack exit plane allowed a quantitative characterization of the total drift emission, the spray module test provided data at selected points in space downwind of the spray modules. Traverses of an efflux plane analogous to the stack exit plane of a cooling tower which would allow a determination of the total mineral mass emission of the spray modules were not attempted.

Ambient airborne salt loadings were measured during the period of August 24, 1973 to January 11, 1974, by means of a network of six sampling stations. Each station consisted of an Airborne Particle Sampler (APS) which measured salt concentration, and a deposition sampler for salt deposition flux measurements. The six sampling stations were distributed over five locations along a line that extended approximately 2,400 m inland from the shore. A total of 82 runs, i.e. simultaneous operation of the network stations, was obtained during the indicated period of time.

Two of the sampling stations were located at a distance of about 15 m from the shore and within 4 m of each other. These stations were always operated simultaneously in order to allow unambiguous comparison of the results. Sixty-five APS and 40 deposition sampler runs were obtained and the average error* between the two values for each run was found to be 7% and 23% respectively.

Between January 31 and July 24, 1974, airborne salt loadings were measured during the operation of either the cooling tower or the two spray modules. About 130 runs were obtained with an enlarged and rearranged network of nine sampler stations. Depending on wind direction, one or more samplers were located upwind of the operating cooling device. This allows comparison of salt loadings upwind and downwind of the cooling device in order to determine its contribution of salt to the atmosphere. The upwind salt loadings also expand the data base of ambient salt loadings to a total of 11 months.

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*The defining equation for the error is given by Equation (44).

A statistical analysis of the APS data is presently being conducted for the Environmental Protection Agency by the Adapt Service Corporation under Contract No. 68-03-2176 (Project Officer: Dr. Bruce Tichenor, National Environmental Research Center, Corvallis, Oregon).

No conclusions are presented since this contract emphasized data acquisition. However, future analysis, interpretation and scale-up of all data will help to evaluate the potential impacts of drift from cooling systems utilizing mechanical draft cooling towers or spray modules.

SECTION II

INTRODUCTION

DEFINITION OF THE PROBLEM

One of the environmental problems associated with evaporative cooling devices such as mechanical draft wet cooling towers and spray modules, besides ground fogging and icing, is the mineral mass emission. The mineral mass is contained in small water droplets which originate with the circulating cooling water, are entrained into the air flow, and are injected into the atmosphere. These droplets, which are called drift, rise with the moist, bouyant plume until they fall out and embark on a trajectory through the ambient atmosphere. Eventually the drift droplets or their mineral residues are collected by vegetation or structures in the surroundings of the cooling device. The ultimate question is how the drift mineral residue affects man-made structures and life indigenous to these surroundings compared to the effects of similar minerals found in the ambient environment. If it can be shown that the impact of the cooling device contributions is negligible compared to ambient levels, environmental acceptability of the cooling device, with respect to drift, may be concluded. This question is particularly important for salt water cooling devices. Some are already in service in near-seashore environments (e.g. Beesley's Point, New Jersey and Chalk Point, Maryland) and more are in the planning stage.

The drift problem outlined above may be broken down into the following five segments:

1. characterization of the drift emission of the source;
2. characterization of drift transport by the plume and through the ambient atmosphere;
3. characterization of the drift mineral residue levels at ground or near-ground levels downwind of the source;
4. characterization of the ambient levels around the cooling device; and

5. characterization of the effects of the drift mineral residue on materials and life forms.

CONSENT DECREE

In 1970 and 1971 Florida Power and Light Company and the Environmental Protection Agency (EPA) were involved in court litigations over the subject of once-through cooling for FP&L's Turkey Point power plant. The plant is located south of Miami, Florida, and consists of two 430 MWe fossil fueled steam electric generating units and two 730 MWe nuclear units. At that time the nuclear units were still under construction, but are completed now.

As a result of court litigations FP&L considered alternative means of condenser cooling, i.e. spray module systems, cooling canal systems, and especially cooling towers. A characteristic of the Turkey Point site is the lack of an adequate supply of fresh water for cooling tower make-up. Consequently, a study was initiated in which Southern Nuclear Engineering, Inc. assessed the state of the technology of saltwater cooling towers. Such towers were already in service, both in the USA and abroad, but were typically 20 to 100 times smaller than what would have been required at Turkey Point. The report[1], which was issued in February 1970, states in part:

> "... Drift represents an outstanding problem area. ... The problems are: (1) how much salt comes out of the cooling towers; (2) what is the size of the area over which this salt is deposited; and (3) what effect does the salt have upon the surrounding environment, including plant and animal life, and soil and structures of the area. The cooling tower suppliers are willing to guarantee a maximum limit of drift from their equipment; however, the industry possesses no accurate standard method for experimentally measuring drift, and therefore present drift guarantees are probably not too meaningful, particularly at low values. The significant problem is that even operating within the guaranteed drift values for currently operating towers, the amount of salt coming out of the Turkey Point cooling towers is calculated to be from 20 to 400 tons per day and area deposition rates are potentially prohibitively high. Prior to building a salt water cooling tower as large as that required for Turkey Point, substantial research, development, and prototype testing will be required. There is no such research development and testing being carried out at this time, or even contemplated. It is judged that a program to do this job would require a minimum of 4 years and several million dollars."

Thus salt water cooling towers were rejected as an alternative to once-through cooling mainly due to the potential salt drift problem. The parties finally agreed on an excavated canal system[2,3] as a means of condenser cooling. This plan was incorporated in a consent decree, the Final Judgement[4], which was issued on September 10, 1971. Among the provisions of the consent decree were the following:

> "Florida Power and Light shall immediately arrange with appropriate officials of the United States, the State of Florida, and other appropriate jurisdictions, to commence studies of : ... (c) mechanical cooling devices such as powered spray modules and other reasonable concepts for reducing adverse environmental effects attributable to the cooling system specified in this Final Judgement: ......
> The studies specified ......, shall be directed toward the determination of the feasibility, practicability and acceptability of utilization of such alternate sources of water as a substitute or supplement for withdrawals of make-up water from Card Sound for the cooling system described in Paragraph V below; ..... shall utilize those waters which, as a result of the studies referred in subparagraph 11 above, the Administrator of the Environmental Protection Agency may identify as being available to provide make-up water for Florida Power and Light's cooling system, to the extent this can be done feasibly and practicably and at a cost which is not disproportionate to the degree of environmental protection to be achieved...."

In order to satisfy this requirement and provide the Administrator of EPA with adequate information on salt water cooling, EPA and FP&L cooperated in an effort to test a single cell mechanical draft wet cooling tower and two spray modules. FP&L provided the cooling tower and the test site, EPA funded the contract Number 68-02-1365 "Demonstration of Mechanical Cooling Devices for Salt Water at Turkey Point", which covers the purchase and installation of two spray modules and the testing phase whose objectives will be addressed in Chapter II. This contract was awarded on July 1, 1973 to Environmental Systems Corporation (ESC), who had since 1971 pioneered the development of drift measurement instrumentation[5].

ENVIRONMENTAL PROTECTION AGENCY'S NEEDS

EPA's needs are stated in Reference 6, as follows:

1. "The National Environmental Policy Act requires Federal licensing agencies to consider alternatives (including cooling systems) to negate or minimize environmental degradation. To date, quantitative information on drift from salt water systems has been inadequate for a definitive position by the utilities, Atomic Energy Commission, or EPA--particularly in respect to (a) ambient air salt concentration and fallout, (b) source characteristics, (c) transport and deposition, and (d) terrestrial impacts. The contract will contribute valuable data on Items (a), (b), and (c) to the literature."

2. "PL 92-500 requires EPA (1) to promulgate acquatic effluent standards for the electric power industry and (b) to issue discharge permits. The contract will contribute to the technical base for executing these requirements in all coastal regions."

SCALE-UP CONSIDERATIONS

The data acquired under this contract and the subsequent data analysis are intended to satisfy one of the provisions of the consent decree: the study of salt water mechanical cooling devices. In using the data presented in this report, it is important to remember that only one single cell cooling tower designed for a water circulation rate of 1260 kg/s (20,000 gpm) and two spray modules designed for a total flow rate of also 1260 kg/s were studied, not a cooling system which would meet the needs of the Turkey Point plant with its combined capacity of about 2300 MWe. The difference lies in single units or small scale versus many units or full scale. If condenser cooling of all four Turkey Point units were to be provided by mechanical draft wet cooling towers or Powered Spray Modules, the cooling system would consist of many cooling tower cells or spray modules. Reference 1 contains an estimate of about 100 cooling tower cells for a specified design condition, but each cell was larger in size, and its heat rejection capability higher, than the cell that was tested at Turkey Point. Reference 7 contains, for the same design conditions as above, an estimate of 700 Powered Spray Modules. Current estimates would likely yield a lower number primarily due to the advances of the last 4-5 years in the state-of-the-art of predicting thermal performance of spray systems.

It should be noted that these estimated numbers of cooling tower cells or spray modules are only quoted here in order to give the reader an order-of-magnitude impression of the size of such an alternate cooling system. The magnitude of these numbers demonstrates that the results of this contract have to be scaled up before they can be considered representative of a full-size cooling system. We understand that the Thermal Pollution Branch of the Pacific Northwest Environmental Research Laboratory is pursuing cooling tower plume studies which may be extended to scale-up problems.

SECTION III

TEST OBJECTIVES AND TEST APPROACHES

The purpose of this contract is to provide data for studying the environmental acceptability of mechanical cooling devices. Such a study is necessary to satisfy one of the provisions of the previously mentioned consent decree (Reference 4). Consequently the thrust is directed towards data acquisition only; data analysis or the aforementioned study itself are specifically not part of the scope of work in this test portion. Data acquisition in a program such as this inevitably leads to an accumulation of data which defy a cursory analysis on the part of the reader. Distillation of basic trends, practical correlations and the relevation of a coherent structure must be reserved for a full scale indepth examination.

TEST OBJECTIVES

The test objectives were formulated as follows:

1. Measurement of ambient airborne sea salt levels at the Turkey Point site. Statistical analysis of the data, a task which is not within the scope of this contract, should determine, for example, average seasonal salt levels, ranges of salt fluctuations, and whether an inland gradient in the ambient sea salt levels exists.

2. Measurement of airborne sea salt levels at the Turkey Point site during operation of one of the cooling devices. An analysis of these data should determine if either of the cooling devices contributes measurably to the sea salt levels over and above the ambient sea salt levels at various distances from the cooling devices and under various meteorological conditions. Again, this analysis is not within the scope of this contract.

3. Drift emission characterization of the cooling tower.

4. Drift emission characterization near the spray modules.

Thus, data were acquired for drift problem areas 1, 3, and 4 of the five areas listed in Section II.

TEST APPROACH

Before the test approach is addressed, a brief description of the site is necessary. This description follows that given in Reference 8. The Turkey Point site is located approximately 50 km south of Miami, Florida, at the west shore of Biscayne Bay. The low, swampy land surrounding the site is extremely flat, rising from sea level at the shoreline to an elevation of only about 3 m at a distance of 13 km west of the site. The site itself has a similar flat natural relief of only 0.3 to 0.6 m above sea level. East of the site, 8 to 13 km across Biscayne Bay, is a series of islands running in a northeast-southwest direction between the Bay and the Atlantic Ocean. Four steam electric generating units are located on the site: two oil-fired units with 430 MWe each and two nuclear units with 730 MWe each. Condenser cooling for all units is provided by a salt-water canal system with dimensions of 8.4 km in north-south direction and 3.5 km in east-west direction. A "hurricane" dike, intended to shield the canal cooling system from hurricane induced flooding, separates the cooling system from the shore of Biscayne Bay, which extends in a general north-south direction. The four generating units are located at the northeast edge of the canal cooling system which dominates the site due to its size.

In the north, the canal cooling system is bound by the feeder canal which runs in an east-west direction. The research cooling tower is located at the north shore of the feeder canal approximately 1,200 m west of the plant, and the two research spray modules are anchored in the feeder canal within a hundred meters of the tower. Neither of these cooling devices is needed for cooling of the power plant.

Agreement on the type and manufacture of the cooling devices tested was reached between EPA and FP&L before the award of this contract.

Manufacturer's specifications for the devices are given in Appendix H, and Figure 1 shows both devices in operation. The contract's test objectives did not include an evaluation of the mechanical, hydraulic or thermal performance of either cooling device. Consequently, only easily measured parameters such as the height and diameter of the spray umbrella of the spray modules were checked. For each drift data point acquired on the cooling tower some operational parameters, such as hot and cold water temperatures, were measured to characterize the performance of the tower during drift data acquisition rather than to verify it.

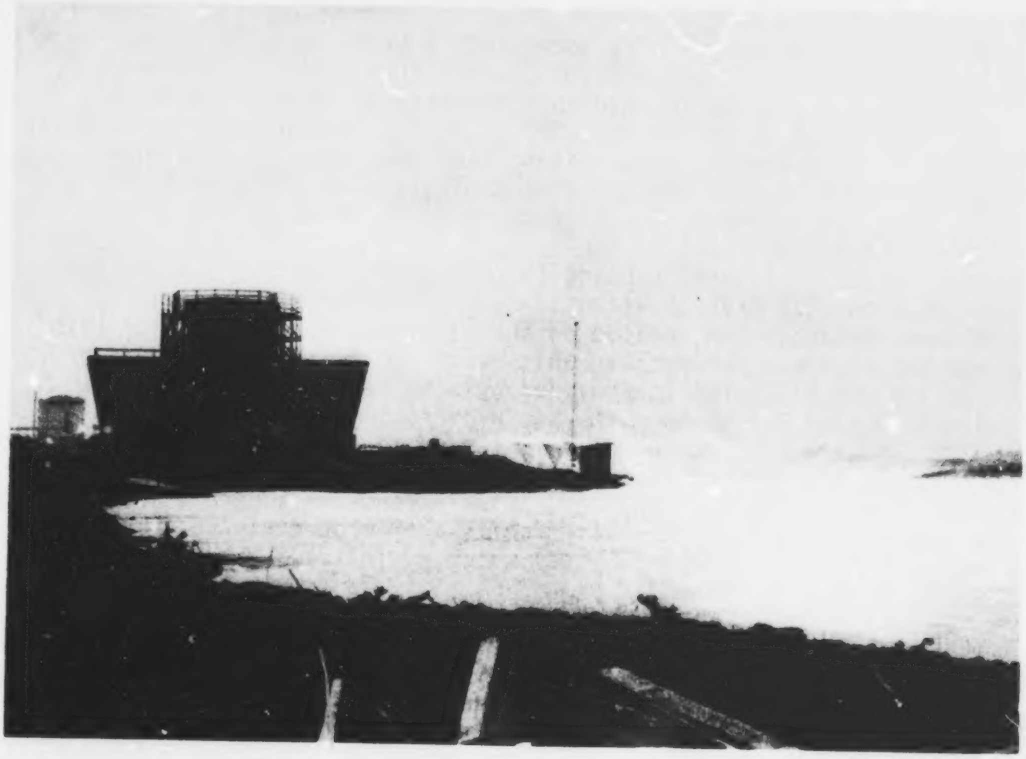

Figure 1. Marley 600/700 one cell wet mechanical draft cooling tower and Ceramic Cooling Tower Company's Powered Spray Modules in operation at Florida Power and Light's Turkey Point site. The barge with its 13 meter (40 feet) tower is also visible.

Note: No data were acquired during simultaneous operation of the cooling devices.

In the following, a brief outline of the test approaches, designed to meet the test objectives, is given. They are discussed in more detail in Sections VI and VII.

In order to meet the test objectives, the following test programs were developed:

Ambient Sea Salt Level Data Acquisition

The ambient sea salt levels were characterized by two parameters:

1. the near-ground airborne sea salt concentration which is the mass of sea salt per unit volume of air; and

2. the near-ground airborne sea salt deposition flux which is the mass of sea salt that crosses a horizontal unit area per unit time.

"Near-ground" represents the fact that the collectors were not located at ground level but at a height of approximately 3 to 4 m above grade at the particular collector location. Six Airborne Particle Samplers, which are described in Section IV were used as airborne sea salt concentration measuring devices along with the same number of deposition samplers. The selection of the station locations was important since one of the goals of a subsequent data analysis will be the detection of an inland gradient. The six samplers of each kind were therefore distributed along an east-west line which is perpendicular to the general north-south orientation of the shore of Biscayne Bay (see Figure 5 and 23). With this experimental set-up, ambient data were acquired at a rate of five runs a week over a period of approximately four months during the time the cooling devices were not operating. Later, during operation of one of the cooling devices, ambient data were also acquired upwind of the operating device increasing the period of time of ambient background data acquisition to a total of eleven months.

Acquisition of Sea Salt Level Data During Operation of One of the Cooling Devices

With one of the cooling devices operating, the sea salt levels were again characterized by the airborne sea salt concentration and the sea salt deposition flux. More sampler stations and a different array of the station locations (see Figures 7 and 23) were used in order to acquire data that would permit an analysis to detect source contributions above the ambient sea salt levels. Over a seven month period, data were acquired at a rate of five runs per week during three months and at a rate of six runs per week during four months.

Cooling Tower Drift Emission Characterization

The basic quantities measured were:

1. the drift droplet size spectrum; and
2. the drift mineral mass flux.

These quantities were measured in the exit plane of the cooling tower stack. A horizontal beam placed diametrally across the exit plane, as shown in Figures 8 and 9, supported the instrument package which could be brought into any position along the diameter. At various positions the Particulate Instrumentation by Laser Light Scattering (PILLS) and the Sensitive Paper (SP) techniques were used to acquire the droplet spectrum and the heated glass bead Isokinetic Sampling technique (IK) yielded data on the drift mineral mass flux. These basic quantities along with the updraft velocity profiles measured with a propeller anemometer were acquired during five diameter traverses with 12 to 16 measuring positions each. The PILLS and SP data reduction yielded subsequently drift mass spectra and drift mass flux spectra for the particular measuring points as well as a drift mass spectrum representative of the cooling tower as a whole during the entire data acquisition period. The IK data yielded sodium and magnesium mineral mass fluxes for the individual positions along the diameter traverses as well as total sodium and magnesium mass emissions for the tower.

The drift characteristics could depend on tower operational data, such as rejected heat, water and air flow, salinity; and on meteorology. Therefore, for each drift data point, those tower operational data that were readily accessible, for example hot and cold water temperatures, the heads in the hot water distribution basins, salinity, and exit air temperature were measured. A meteorological tower, located approximately 50 m east of the cooling tower, provided meteorological data continuously during drift data acquisition periods.

Drift Emission Characteristics Near the Spray Modules

A fundamental difference exists between the drift emission characterization of a cooling tower and that of a spray module. It is recognized that a cooling tower has a well-defined efflux plane in which measurements can be made to characterize the drift emission. Such a plane, however, does not in principle exist uniquely for a spray module since the emission and transport phenomena are dependent upon the local climatology (ground level wind speed, wind direction and turbulence, and the dry and wet bulb temperatures of the air). If measurements are made in the near proximity of the modules, e.g. within 1 to 5 m of the downwind spray umbrella, then the droplets crossing the measurement plane could be characterized by a set of measurements having small horizontal and vertical extent but would not be necessarily representative of the transport of drift beyond the spray canal or the plant property line. In other words, measurements made under given wind conditions in a plane near the source may have large contributions by large droplets which may not leave the spray canal under the given wind conditions.

On the other hand, if measurements are made at, e.g. 100 to 200 m distance from the source, then that part of the drift is measured which is clearly transported from the spray canal into the environment. However, much larger horizontal and vertical excursions have to be made in order to represent the drift that is transported across the measuring plane.

Clearly, this problem is more severe when the winds are variable in either speed or direction. Thus, a measurement plane(s) must be chosen which is a compromise between non-representative but easily obtained data and more representative but more difficult to obtain data.

Recognizing this principal difficulty, the primary goal of this spray module test (the first that was ever attempted to the knowledge of the authors) was to obtain, under meteorological conditions as constant as possible, drift droplet size spectra and drift mineral mass flux data at certain distances downwind of the modules as a function of height. However, these data do not allow the calculation of drift and mineral mass emission rates for the spray modules. It was hoped, of course, that wind speed and direction would be sufficiently steady for a sufficient period of time to allow a complete traverse of a measurement plane such that emission rates could be determined.

The same instrumentation as mentioned previously in this section was used here. The instrument package was traversed along a vertical mast positioned on a barge as shown in Figure 16. The barge was completely self-sufficient containing all support equipment for the instrument package and motor generators for electric power.

SECTION IV

INSTRUMENTATION AND DATA REDUCTION

In this section, descriptions of the instruments employed in the test program are given along with the fundamental equations used in the data reduction. Techniques for measuring drift droplet size and number density are described first, followed by a description of how these data are consolidated into a meaningful representation of the droplet emission characteristics. Next follows a description of the instrumentation for measuring mineral mass flux. Then some remarks are made regarding the comparison of parameters derived from the droplet size spectra and parameters derived from mineral mass flux data. Then a description of the support instrumentation used in drift emission measurements is presented, followed finally by a section on instrumentation for airborne sea salt concentration and deposition flux measurements and a discussion of these parameters.

DRIFT EMISSION TEST EQUIPMENT

PILLS II System

The PILLS II System has been developed to provide *in situ*, on-line measurements of drift droplet density distributions in cooling towers. The PILLS technique of droplet sizing was developed under the sponsorship of the Environmental Protection Agency (Contract Number 16130GNK, Project Officer: Frank H. Rainwater), and first demonstrated[5] in Oak Ridge, Tennessee, in 1971. Since then, field experiments such as those conducted in Hornaing, France, Homer City, Pennsylvania, and again in Oak Ridge, have demonstrated its measurement capability and field reliability. The PILLS instrument employed at Turkey Point is designated PILLS II-A and was the latest generation of that line of instrumentation.

The operating principle of the PILLS System is described in References 5, 9 and 10. This electro-optical instrument produces a voltage output which is related to the size of a droplet which is present in the external sampling volume coincident with a pulse of laser light. The size of the sampling volume is determined such that it is unlikely that multiple droplets in the size range of interest will be simultaneously present in the volume. For most of the Turkey Point measurements, this volume was 2.33 cubic centimeters.

References 9 and 11 describe the calibration of the PILLS System which is accomplished by means of a vibrating orifice monodisperse water droplet generator. Based on the calibration with droplets of known, uniform size the overall accuracy of the PILLS System was found[9] to be ±15%.

The voltage pulses generated by the PILLS System were fed into a pulse height analyzer (PHA) especially developed for the system with 128 independently adjustable channels, of which typically a third were used for storing PILLS data. The pulse height analyzer provides as output a voltage distribution which is analyzed via calibration data to yield the particle density distribution, p(d), which is defined as:

$$p(d) = \frac{\Delta N_{ij}}{\Delta d_i . V_s}$$

$$= \frac{\text{number of droplets in size range } \Delta d_i}{\text{droplet size range } \Delta d_i \ (\mu m) \ \times \ \text{sampled air volume } (m^3)} \qquad (1)$$

where i represents the droplet size range and j the location in or near the source. The particle density distribution is the basic parameter measured by the PILLS System, and it represents the number of droplets per unit droplet size range and unit volume of air. As described below, other parameters may be derived from it.

The PILLS instrument used at Turkey Point was set up to generate particle density distribution data in the droplet diameter range of approximately 40 to 1,000 μm. The upper limit is determined by the amplifier saturation point and statistical quality of the field data, i.e. the number of pulses per PHA voltage channel accumulated during the measuring time, or, in terms of droplet size, the number of droplets per diameter range accumulated during the measuring time. The lower limit is typically determined by either electronic noise or by optical noise caused by a number of small water condensate droplets (fog) that are in the sampling volume each time it is illuminated by a laser light pulse. The fog droplets which are believed to be smaller than 10 or 20 μm in diameter generate stray light which interferes with the sizing of droplets of the same and larger diameters. The lower limit due to electronic noise is determined by operating the PILLS instrument for a period of time outside of the cooling tower plume, i.e. without droplets entering the sampling volume. At Turkey Point such electronic noise background runs which lasted between 30 and 60 minutes were obtained daily during the first week of testing. Since the test results showed a constant electronic noise background, the number of background runs was subsequently reduced to one per week. The lower limit, due to electronic noise, was consistently about 40 μm. The effect of fog on the lower limit has to be determined during each actual measurement since it varies with both measurement location and time. The lower limit of the droplet diameter range was during the cooling tower test between 40 and 70 μm due to a low level of fog. The upper limit of the droplet diameter range, which is affected by actual field conditions as is the lower limit, was during the cooling tower test usually 600 μm and during the spray module test 250 to 350 μm depending primarily on the position of the instrument relative to the spray modules and the wind speed. More information regarding the droplet size limits will be given later in this section and in Section VII.

The drift mass density distribution, defined as $\Delta\chi_{ij}/\Delta d$, represents the mass of droplets per unit droplet diameter range and unit volume of air as a function of the droplet diameter. It is derived from the particle density distribution:

$$\frac{\Delta\chi_{ij}}{\Delta d} = \frac{\Delta N_{ij}}{\Delta d_i . V_s} \frac{\pi}{6} \bar{d}_i{}^3 \; s_i \quad (\mathrm{gm}/\mu\mathrm{m}\cdot\mathrm{m}^3) \tag{2}$$

where $\bar{d}_i$ is the center diameter of droplets in the size range i and s_i is the representative density of the drift droplets in the size range i. Since s_i is generally unknown, an assumption has to be made which will be discussed at the end of this section. The drift mass concentration represents the mass of droplets in the droplet size range Δd_i per unit volume of air:

$$\Delta\chi_{ij} = \frac{\Delta N_{ij}}{\Delta d_i \cdot V_s} \Delta d_i \frac{\pi}{6} \bar{d}_i{}^3 \; s_i \quad (\mathrm{gm}/\mathrm{m}^3) \tag{3}$$

and the total drift mass concentration at a measuring point is obtained by summation over the measured size ranges:

$$X_j = \sum_i \Delta X_{ij} = \frac{\pi}{6} \sum_i \frac{\Delta N_{ij}}{\Delta d_i \cdot V_s} \Delta d_i \; \bar{d}_i{}^3 \; s_i \quad (\mathrm{gm/m^3}) \qquad (4)$$

provided that:

1. the drift droplet size spectrum does not extend below the lowest droplet size detectable by PILLS;

2. the fog droplet size spectrum at the exit of the cooling tower fan stack which is generally assumed to be confined to diameters of smaller than 10 or 20 μm, does not extend into the region of the PILLS sensitivity.

The drift mass flux in the size range i is the mass of drift droplets in that size range that crosses the area ΔA in unit time. For a mechanical draft cooling tower with a circular stack, ΔA is a section of an annulus in the tower exit plane whereas for spray modules it can be part of a plane that is downwind of the modules and perpendicular to both the earth's surface and to the mean horizontal wind vector. The drift mass flux is computed by multiplying the drift mass density by the droplet velocity component perpendicular to ΔA. For the tower, this velocity component is vertical, hence the droplet terminal velocity must be taken into account. In this case the drift mass flux for the size range i is given by

$$\frac{\Delta D_{ij}}{\Delta A} = \Delta X_{ij} \; (\bar{v}_{uj} - v_{ti})$$

$$= \frac{\Delta N_{ij}}{\Delta d_i \cdot V_s} \Delta d_i \; \frac{\pi}{6} \; \bar{d}_i{}^3 \; s_i \; (\bar{v}_{uj} - v_{ti}) \quad (\mathrm{gm/m^2 \cdot s}) \qquad (5a)$$

where ΔD_{ij} is the drift mass emission rate in the size range i and at location j, $\Delta D_{ij}/\Delta A$ is then the associated drift mass flux, $\bar{v}_{uj}$ is the vertical component of the time-mean air updraft velocity and v_{ti} is the terminal velocity of a droplet with diameter $\bar{d}_i$.

For spray modules the velocity of the droplets perpendicular to ΔA is assumed to be equal to the time-mean horizontal wind speed. Thus, the drift mass flux for the size range i is

$$\frac{\Delta D_{ij}}{\Delta A} = \Delta X_{ij} \ \bar{u} = \frac{\Delta N_{ij}}{\Delta d_i \cdot V_s} \ \Delta \bar{d}_i \ \frac{\pi}{6} \ d_i{}^3 \ s_i \ \bar{u} \quad (\mathrm{gm/m^2 \cdot s}) \tag{5b}$$

with $\bar{u}$ as the time-mean horizontal wind speed.

The total drift mass flux at location j is obtained by summation over the size ranges:

$$\frac{\Delta D_j}{\Delta A} = \sum_i \frac{\Delta D_{ij}}{\Delta A} \qquad (\mathrm{gm/m^2 \cdot s}) \tag{6}$$

provided the same considerations regarding the drift and fog droplet spectra apply as mentioned previously in the calculation of total drift mass concentration at a measurement point. The total rate of drift mass emission, D, then, is given by

$$D = \sum_j \left(\frac{\Delta D_j}{\Delta A}\right) \Delta A_j \qquad (\mathrm{gm/s}) \tag{7}$$

In the case of cooling tower measurements, this summation covers the exit area of the tower. In the case of spray module testing, the geometrical extent of the drift plume must be determined before this summation can be realized. At Turkey Point the extent of the drift plume was not determined, as mentioned before. The drift emission of the spray modules was rather characterized at each of the measurement positions, that is, at certain points in space within the drift plume.

If the drift emission is to be characterized by the drift fraction, Δ, which expresses the drift emission in percent of the circulating water mass flow rate, R, then:

$$\Delta = \frac{D}{R} \times 100\% \tag{8}$$

Equation (2) introduced s_i, the representative density of drift droplets in the size range i. The density of drift droplets depends on the kind of minerals contained in the droplets, and on their concentration. With regard to the kind of minerals and their respective mass ratios, it is assumed that both are equal to those of the circulating cooling water. The mineral concentration, however, is unknown because it may change due to evaporation or condensation. Fortunately, even though the concentration may change considerably, the associated density change is relatively small. For aqueous sodium chloride solutions, for instance, the concentration may change from 20,000 ppm to 317,460 ppm (saturated solution), whereas the density changes only from 1.013 to 1.2 gm/cm³, respectively.

In view of this fact, the density of all drift droplets is assumed to be equal to that of the circulating cooling water: $s_i = s_{cw}$. Since the difference in density of the cooling water for salt water cooling towers and the density of pure water, s_w, is less than 2%, the assumption is extended here to

$$s_i = s_{cw} = s_w = 1.0 \text{ gm/cm}^3 \tag{9}$$

Sensitive Paper Machine

A completely independent and complementary technique to the PILLS System utilizes the well-known principle of water-sensitive paper[12,9]. This paper is chemically treated according to published procedures such that a droplet of water impinging on it will produce a stain whose size is related to the original droplet size and to the dynamics of its impingement. The relationship between the stain and the droplet size is obtained by calibrating the Sensitive Paper System by means of the vibrating orifice monodisperse water droplet generator over a range of droplet sizes and impingement velocities ranging from 2.5 m/s to 15 m/s. The paper is employed in machines which offer controlled exposure of the paper to the drift droplets and protect the paper before and after the exposure period.

The overall accuracy of the SP technique is estimated to be approximately ±15% for droplets larger than 50 μm. For droplets less than 50 μm in diameter the accuracy of droplet size determination is better than ±15% but the effective volume sampled is reduced and must be corrected as explained later. No accuracy has been established yet for the correction factor.

The Sensitive Paper technique is employed to extend the particle density distribution obtained by the PILLS System towards smaller droplet diameters which are below PILLS' sensitivity limit. Moreover, since the SP technique typically provides droplet size data in the range of approximately 10 to 200 μm, cross checks between the two droplet sizing techniques are possible.

The lower limit of this diameter range is due to the aerodynamics of the flow around the disc-shaped sampling head and the dynamics of the droplets in the flow. It is therefore a function of the droplet size, mass and speed, the geometry of the sampler and the air speed. The upper limit is due to the number of stains generated on one disc. If the number of drift droplets per unit volume of air increases as the droplet diameter decreases, as is characteristically observed in a cooling tower or downwind of spray modules, then the exposure time of a sensitive paper is limited by the number of small droplets impinging on the paper. With proper exposure time the stains caused by these small droplets cover most of the area of the paper, and the number of stains of larger droplets becomes fewer as the droplet diameter increases. With only a few, say five or less, large droplet stains per sensitive paper, the calculated particle density distribution data may become erratic. This indicates the upper limit of the diameter range for which particle density distribution data can be obtained from a particular sensitive paper.

The upper limit cannot be increased by a longer exposure time since this would yield overlapping stains and a resulting loss of stain definition. However, it can be increased by properly exposing more than one sensitive paper and adding the number of stains, but this necessitates the processing of more sensitive papers which becomes economically less feasible with an increasing upper limit of the droplet size range.

The processing of the exposed sensitive papers consists of measuring the stain diameters by means of a microscope with a reticle eyepiece and grouping the counts of all stains by stain size ranges. A statistically significant number of stains, typically about four hundred, are counted for each of the papers. Since the number of stains per stain size range usually decreases with increasing stain size as already outlined, three sensitive paper counts are typically made.

The stain diameters given here should not be confused with drift droplet diameters which must be inferred from calibration data.

Small Stain Count - More than 250 stains of diameters smaller than 300 to 400 μm are counted and sized. This number of small stains is usually obtained from just a portion of the total area of the sensitive paper.

Medium Stain Count - Stains in the diameter range of 200 to 1,500 μm are counted. Here a larger portion of the sensitive paper area usually must be interrogated in order to size and group a total number of 150 stains.

Large Stain Count - The entire area of the sensitive paper is interrogated for stains larger than 1,000 μm in diameter. In this type of count, the frequency of the large droplets is usually quite low necessitating treatment of the data on a single droplet basis as explained in Section VII.

It should be noted that the quoted stain size ranges are typical ones and are those used in the Turkey Point data reduction. The stain size ranges may change depending on the stain size distribution and the stain density on a particular sensitive paper. Compared to counting and sizing every stain on the paper, the outlined method is economically more feasible and does not compromise the data quality. That is, data accuracy remains within the limits previously quoted.

Once the stain sizes are counted and grouped according to size, calibration curves for specific stain sizes and impaction velocities are used to generate the original droplet sizes from which the stains were formed. A consolidated p(d) curve is then generated for each measurement position from the SP and PILLS particle size distribution data. This step will be discussed in the following section titled "PILLS and SP Data Consolidation".

Three types of sensitive paper machines were employed at Turkey Point:

1. The SP machine used on the barge had a pair of rotating sampling heads, each of which exposed one sensitive paper disc measuring 47 mm in diameter. It utilized a small motor that gave the sampling heads a constant peripheral speed of 10 m/sec. The axis of rotation was parallel to the average wind direction and the heads were aligned such that the sensitive paper plane was parallel to the average wind direction and therefore also parallel to the horizontal component of the droplet trajectory. This design has two advantages:

    a. the impingement speed of 10 m/s is larger than usual wind speeds at the site (wind speeds from 1 to 7 m/s were observed during the module test). This increases the collection efficiency which, according to Reference 13, increases with the velocity in a non-linear fashion. Consequently data quality is improved although no experimental correction factors for collection efficiency have been established for these lower impingement velocities. However, a correction factor is known for 10 m/s as explained in (2).

b. The impingement speed is constant, which facilitates calibration curve use.

2. The Strip SP Machine is the same as the one described above under (1) except that it exposes a 3 mm wide, 47 mm long strip of sensitive paper instead of a 47 mm diameter disc. The collection efficiency of the strip for small droplets is substantially better than that of the disc. According to Reference 13 it is 90% for 15 μm diameter droplets and 50% for 5 μm diameter droplets. That is, 90% of the 15 μm droplets equally distributed throughout a volume whose cross-sectional area is identical to that of the SP strip will impact on the strip when it is swept through the volume at a velocity of 10 m/sec. This machine was used to obtain experimentally the correction factor between strip and disc data for an impingement velocity of 10 m/s, as will be described later.

   It should be noted that the Strip SP Machine is not a suitable substitution for the SP machine that exposes sensitive paper discs. The sensitive paper strips have only about 8% of the area of the discs and the number of droplets collected by the strips is therefore also only about 8% of the number of droplets collected by the discs. This is of no consequence regarding the small droplets of interest (smaller than about 50 μm in diameter). A correctly exposed strip always collects more than needed for a small stain count. The number of stains, however, that are recorded during the medium stain count is usually much less than the required number of 150 stains. Thus the strips collect an insufficient number of droplets larger than about 50 μm in diameter which prevents the generation of p(d) data for this droplet size range.

3. The SP machine used on the cooling tower was equipped with a stationary head instead of two rotating heads. The advantage of the stationary head is that it provides data at a well defined point in the cooling tower exit plane, whereas the rotating heads provide an average over a circular path whose diameter is 0.6 m and therefore large compared to the change of updraft velocity in the exit plane along

a diametral traverse. The stationary head is aligned such that the plane of the sensitive paper is parallel to the tower exit plane. The impingement velocity is therefore the vertical component of the time-mean droplet updraft velocity:

$$\bar{v}_{p\,ij} = \bar{v}_{uj} - v_{ti} \quad \text{(m/s)} \tag{10}$$

The SP machine, with the rotating heads, generates as the basic parameter the particle density distributions p(d) like the PILLS System. The sensor heads on this device sweep out a volume of air in a direction perpendicular to the air flow and in the process collect the drift droplets in that volume. Equations (1) to (8) are therefore directly applicable.

The SP machine with the stationary head collects only those droplets which, due to the air flow, are transported to the plane of the sensitive paper. Large droplets in the updraft air do not move at the same speed as the air due to their settling velocities. Consequently, even if they were present in the same numbers as the small droplets, not as many would strike the sensitive paper surface during the sampling time. This device, then, measures the droplet number flux directly, from which the particle density distribution, p(d), can be found as outlined in the following. The droplet number flux is the number of droplets that cross a unit area in unit time. For a size range i this can be written as:

$$\frac{\Delta N_{ij}}{A_s . t_s}$$

$$= \frac{\text{number of droplets in size range } \Delta d_i}{\text{area of the sensitive paper x sampling time}} \tag{11}$$

The drift mass flux in the size range i is then

$$\frac{\Delta D_{ij}}{\Delta A} = \left(\frac{\Delta N_{ij}}{A_s \cdot t_s}\right) \frac{\pi}{6} \; s_i \; \bar{d}_i^{\,3} \quad (\text{gm/m}^2 \cdot \text{s}) \tag{12}$$

Equating Equation (12) and (5a) yields the particle density distribution, p(d):

$$p(d) = \frac{\Delta N_{ij}}{\Delta d_i \cdot V_s} = \frac{\Delta N_{ij}}{A_s \cdot t_s} \cdot \frac{1}{(\overline{v}_{uj} - v_{ti}) \cdot \Delta d_i} \quad (m^{-3} \cdot \mu m^{-1}) \tag{13}$$

Having acquired this basic parameter, the data reduction may proceed in the same way as described for the PILLS System.

As outlined earlier, the Strip SP Machine was used to obtain experimentally the correction factor between strip and disc data for a 10 m/s impingement velocity. The correction factor enables us to extend the useful range of the disc data below the theoretical lower limit of approximately 36 μm diameter droplets without exposing a sensitive paper strip for every sensitive paper disc.

The correction factor is defined in terms of the collection efficiencies at a given droplet diameter:

$$\beta_i = \left. \frac{E_{strip}}{E_{disc}} \right|_{\overline{d}_i} \tag{14}$$

where β_i is the correction factor for the size range i and E_{strip} and E_{disc} are the collection efficiencies of the strip and the disc, respectively, at the center diameter $\overline{d}_i$ of the size range Δd_i.

Experimentally the correction factor is given by

$$\beta_i = \left. \left(\frac{\Delta N_i}{\Delta d_i \cdot V_s} \right) \text{strip} \Big/ \left(\frac{\Delta N_i}{\Delta d_i \cdot V_s} \right) \text{disc} \right|_{\overline{d}_i} \tag{15}$$

The correction factor depends on both the droplet diameter and the impingement velocity. As stated above the experiment was designed to obtain β_i for an impingement velocity of 10 m/s. Since β_i does not depend on the location of j, other than in terms of the velocity at j, ΔN_i instead of ΔN_{ij} appears in Equation (15).

Experimental determination of the correction factor in terms of both the droplet size and the impingement velocity is a more involved task and was not the goal of the rather brief experiment during the winter test.

Correction factors for a range of droplet diameters greater than 10 μm were experimentally obtained, and after comparing them with the theory[13], the following correction factor as a function of the diameter was extracted and used in the data reduction:

$$\beta = \begin{cases} \dfrac{50}{d} & \text{for 10 m/s impingement velocity and} \\ & 10 < d < 50\ \mu\text{m} \\ 1 & d < 50\ \mu\text{m} \end{cases} \qquad (16)$$

where both numerator and denominator have the same dimension of μm.

The correction factor β was used in the reduction of the sensitive paper data of both the spray module and the cooling tower tests. The spray module data were acquired with a fixed impingement velocity of 10 m/s (SP machine with rotating collection heads) and the correction factor is therefore directly applicable. However, the impingement velocity during the cooling tower test was approximately equal to the local vertical air updraft velocity (SP machine with stationary collection head) and differed therefore usually from 10 m/s. The application of β to the cooling tower data introduced therefore an error. Average updraft velocities at the SP measurement points in the tower ranged from 4.5 to 13.8 m/s. Whenever the droplet velocity was smaller than 10 m/s, the drift emission of droplets smaller than 50 μm in diameter is underestimated; whenever it is larger, the drift emission of droplets smaller than 50 μm is overestimated. Since 67% of the average updraft velocities taken at SP measurement points were larger than 10 m/s, the total drift emission rate and thus the drift fraction are probably slightly overestimated.

PILLS and SP Data Consolidation

When both the PILLS and SP techniques are used together in drift measurements, the data are usually consolidated in a fashion so that only one particle density distribution curve, p(d), results from each measurement point. The first step in generating this curve is to plot the data points generated by the small, medium and large sensitive paper stain counts, and the p(d) data points generated by the PILLS System. The second step is to generate the single p(d) - curve which consolidates the constituent data points.

Some subjective judgement enters into fitting the consolidated curve to the data points. For instance, the corrected SP data for droplet diameters smaller than 50 μm are usually taken at face value instead of the PILLS data because of the fog background which limits the PILLS system's lower detection limit to droplet diameters larger than approximately 70 μm. Since the PILLS System sampled per measurement point typically 4 to 7 times more air volume than the SP System, the PILLS count frequency was proportionally higher per droplet diameter range. Consequently, the PILLS data are weighted heavier than the SP data, especially above droplet diameters of approximately 200 μm where the number of droplets that result in a medium stain count data point becomes small, e.g. less than 10. The two independent droplet sizing techniques overlap between droplet diameters of 70 to 200 μm, and both sets of data show good agreement.

An example of a typical consolidated p(d) - curve is shown in Figure 2. The data points were generated by the PILLS System and by SP small and medium stain counts. At about 30% of all measurement positions in the cooling tower exit plane the SP large stain count showed 1 to 3 droplets with diameters larger than 600 μm. Since this is an insufficient statistical basis to formulate a p(d) data point, no data generated by the SP large stain count are included in any of the consolidated p(d) curves. Such single large droplets were not observed during the spray module test.

Cooling Tower Composite Curve

Once a particle density distribution, p(d), is established for each measurement point (either just from PILLS data, or just from SP data, or a consolidation of the data of both), various other parameters characterizing the drift emission at the particular measurement point can be calculated as outlined before. Drift emission rates can be determined if the geometrical extent of the drift efflux plane is known, which is the case for the cooling tower but not for the spray modules as mentioned before.

At Turkey Point, drift data were obtained at measurement positions along two perpendicular diameters of the efflux plane of the cooling tower. These two diameters were traversed a total of 5 times, 4 times during the winter test phase and once during the summer test phase. Both meteorology and tower operational conditions were different during these two test phases, and they were also different, to a lesser degree, for each measurement position of a diameter traverse.

For applications such as drift transport calculations the data for all measurement positions must be combined into one distribution which distributes the total drift mass emission according to droplet diameter ranges. Totally this single distribution would characterize the drift water emission of the cooling tower for the various meteoro-

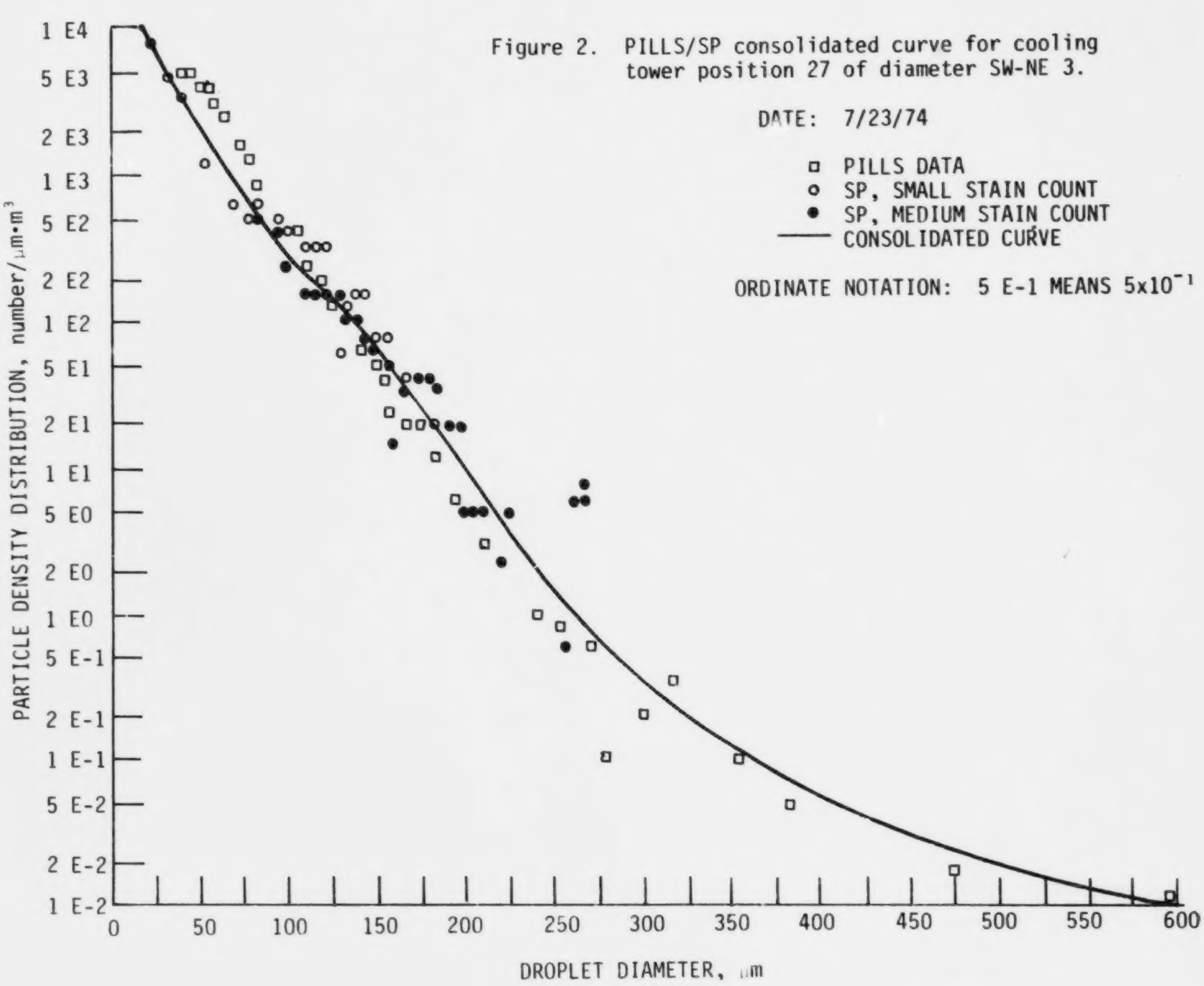

Figure 2. PILLS/SP consolidated curve for cooling tower position 27 of diameter SW-NE 3.

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logical and tower operational conditions that typically occur during a period of time such as a season or a year.

In the following it is described how all cooling tower data obtained at Turkey Point by means of the droplet sizing techniques, PILLS and SP, are combined into a single drift mass density distribution (which was defined as mass of droplets per unit droplet diameter range and unit volume of air). This composite drift mass density distribution thus represents the drift water emission of the Turkey Point cooling tower under the meteorological and operational conditions experienced during the testing phases. There are possibly other parameters which could characterize the drift water emission of this cooling tower, but this question will not be addressed in this report.

Equation (5a) which is rewritten here for convenience is the starting point in the formulation of the composite drift mass density distribution, $\Delta X_i/\Delta d|_{\text{composite}}$:

$$\frac{\Delta D_{ij}}{\Delta A} = \Delta X_{ij} \quad (\bar{v}_{uj} - v_{ti}) \tag{5a}$$

$\Delta D_{ij}/\Delta A$ is the drift mass flux in the size range i, ΔX_{ij} is the drift mass concentration in the size range i and at the measurement location j, $\bar{v}_{uj}$ is the time-mean air updraft velocity at location j, and v_{ti} the settling velocity of a droplet with a diameter which is centered in the size range i.

From each diameter traverse the total rate of drift mass emission of the tower in a droplet size range i, ΔD_i, can be calculated, assuming azimuthal symmetry:

$$\Delta D_i = \sum_j \Delta X_{ij} \quad (\bar{v}_{uj} - v_{ti}) \, \Delta A_j \tag{17}$$

where ΔA_j is the area associated with the measurement position j. In the case of a diameter traverse across a circular exit area, ΔA_j represents one-half of an annulus. The composite, or average, rate of drift mass emission of the tower in the droplet size range i is obtained by summation over the measurement positions of all 5 diameter traverses, and division by the number of diameter traverses:

$$\Delta D_i \text{ composite} = \frac{1}{N} \sum_{n=1}^{N} \sum_{j} [\Delta X_{ijn} \cdot (\bar{v}_{ujn} - v_{ti}) \cdot \Delta A_{jn}] \tag{18}$$

where N is the total number of diameter traverses, which is here N=5, and n indicates a particular diameter traverse.

The composite drift mass density distribution for the cooling tower, $\Delta X_i/\Delta d|_{\text{composite}}$, can now be derived as follows from Equation (5a):

$$\left.\frac{\Delta X_i}{\Delta d}\right| \text{composite} = \frac{\dfrac{\Delta D_i \text{ composite}}{\Delta d}}{A \cdot (\bar{v}_u - v_{ti})} \tag{19}$$

All quantities in this equation are now related to the cooling tower as a whole and not to a particular measurement position, and appropriate numerical values for the area A and the time-mean air updraft velocity $\bar{v}_u$ have to be selected. Here the exit area of the cooling tower fan stack and the average air updraft velocity as defined by the ratio of design volumetric air flow rate to the cooling tower fan stack area were used. These quantities are known for any tower as opposed to, for instance, the area of the annulus of the fan stack exit for which the air updraft velocity is positive. The numerical value of such an area would have to be established by measurements.

Thus, with these well-defined cooling tower parameters, Equation (19) becomes

$$\left.\frac{\Delta X_i}{\Delta d}\right| \text{composite} = \frac{\dfrac{\Delta D_i \text{ composite}}{\Delta d}}{A_{fse} \left[\dfrac{\dot{V}_{air}}{A_{fse}} - v_{ti}\right]} \tag{20}$$

where A_{fse} is the area of the fan stack exit and $\dot{V}_{air}$ is the design volumetric air flow rate. Equations (18) and (20) were used to calculate a composite drift mass density distribution, shown in Figure 11, and from it, other composite drift emission parameters as discussed in Section VII.

Isokinetic Sampling System (IK)

In the planning stage of the Turkey Point program, the instrument for measuring the mineral mass flux was chosen to be the heated glass bead isokinetic sampling system. This system was chosen over the isokinetic cyclone separator, which also measures mineral mass flux, because of the inherent simplicity of the glass bead design, a factor of significance in field operational reliability and convenience in handling. There is no danger of water leakage once the sampling tubes are exposed and sealed as there is when drift water samples are taken.

The heated glass bead isokinetic sampling tubes collect minerals contained in the drift droplets which evaporate after impinging upon the hot glass beads. The air velocity through the tube is adjusted so that it is equal to the time-mean velocity of the updraft air as determined by measurements with a vane anemometer. The minerals collected in the IK tubes are stripped from the tubes with a wash solution which is then chemically analyzed. A statement from the chemical laboratory with regard to the accuracy of the analytical procedure is presented in Appendix I.

The basic parameter generated by the IK system is the total mineral mass flux, F_{kj}:

$$F_{kj} = \frac{\text{minerals collected}}{\text{sampling time x sampling area}} = \frac{M_{kj} - M_{Bk}}{t_s \cdot A_s} \quad (\text{gm/m}^2\cdot\text{s}) \qquad (21)$$

where the index k represents either a chemical element or compound for which the sampling tubes are analyzed, or all collected minerals. For the Turkey Point measurements the index k represents sodium and magnesium. The index j represents, as before, the measurement location, M the mass of the element or compound or total minerals stripped from the IK, tube and M_{Bk} is the average background value of the tubes for the kth element or compound. The sampling time and the cross-sectional area of the IK tube are t_s and A_s, respectively. For the tubes used at Turkey Point, A_s is equal to 5.07 cm². The mineral mass concentration, ϕ_{kj}, is the mineral mass flux divided by the time-mean representative droplet updraft velocity at j, $\bar{v}_{pj}$:

$$\phi_{kj} = \frac{M_{kj} - M_{Bk}}{t_s \cdot A_s \cdot \bar{v}_{pj}} = \frac{M_{kj} - M_{BK}}{t_s \cdot A_s \cdot \bar{v}_{uj}} \frac{\bar{v}_{uj}}{\bar{v}_{pj}} = \frac{M_{kj} - M_{Bk}}{V_s} \frac{\bar{v}_{uj}}{\bar{v}_{pj}} \quad (\text{gm/m}^3) \qquad (22)$$

where V_s is the sampled air volume and $\overline{v}_{uj}$ is the time-mean air updraft velocity at location j.

The time-mean air updraft velocity at location j, reduced by the settling velocity of a droplet with mass median diameter as determined from the droplet size spectrum measured at location j, may be used as time-mean representative droplet updraft velocity. However, since the air updraft velocity at those points of the Turkey Point tower which emit at least 50% of the total mineral mass is at least 10 m/s, as compared to settling velocities of 0.25 m/s and 0.7 m/s for droplets with diameters of 100 and 200 μm, respectively, the assumption of $\overline{v}_{pj} = \overline{v}_{uj}$ was used in the Turkey Point data reduction. For mechanical draft cooling towers this is generally a very satisfactory assumption.

The mineral mass emission of the k^{th} element at location j can be found from the mineral mass flux:

$$\Delta m_{kj} = F_{kj} \cdot \Delta A_j = \frac{(M_{kj} - M_{Bk}) \cdot \Delta A_j}{t_s \cdot A_s} \quad \text{(gm/s)} \tag{23}$$

where ΔA_j is an area associated with the measuring location j. The total mass of the k^{th} element crossing the measurement plane is obtained by summation over the measurement locations:

$$m_k = \sum_j \Delta m_{kj} \quad \text{(gm/s)} \tag{24}$$

For the Turkey Point cooling tower the measurement plane was the exit plane of the fan stack. For spray modules the measurement plane is oriented perpendicular to the time-mean wind direction and located downwind of the modules. In order to obtain the total mineral mass crossing through such a plane the geometrical extent of the drift plume has to be determined as well as mineral flux data within the drift plume and the measurement plane. Since the determination of the geometrical extent of the drift plume was not attempted at Turkey Point, Equations (23) and (24) are not applicable to the spray module drift emission.

Similarly to the drift fraction which was given in Equation (8) a mineral mass emission fraction, η_k, can be defined as the total mass of the k^{th} element emitted from the cooling tower in percent of the mass flow rate of the k^{th} element circulating as solute in the water:

$$\eta_k = \frac{m_k \cdot s_{cw}}{R \cdot C_k} \times 100\% \qquad (25)$$

where C_k is the concentration of the k^{th} element or compound in the circulating water (mass of solute per unit volume of solution), R is the mass flow rate of the cooling water and s_{cw} is the density of the cooling water. It is assumed in Equation (25) that s_{cw}, C_k and R remain constant during the period of time in which the Δm_{kj}'s are measured. If this were not the case the following equation applies:

$$\eta_k = \sum_j \frac{\Delta m_{kj} \cdot s_{cw}}{R \cdot C_k} \times 100\% \qquad (26)$$

where s_{cw}, R and C_k are determined for that period of time during which the individual values of Δm_{kj} are measured. At Turkey Point R was always constant during a diameter traverse. Furthermore, the approximation of $s_{cw} = 1.0$ gm/cm³ which was introduced already in the description of the PILLS data reduction applies here as well.

Ideally the mineral mass emission fraction does not depend on the particular element or compound used to calculate it; that is, another element or compound should yield the same value for the mineral mass emission fraction. The underlying assumption is that the concentration ratios in the drift droplets are the same as in the circulating cooling water. In experimental practice, however, if the IK tubes are analyzed for different elements, different numerical values for the mineral mass emission fractions will be obtained. For this reason the subscript k was retained on the left hand side of Equation (25) and (26).

Finally the different numerical values of the mineral mass emission fraction calculated for different elements or compounds can be averaged:

$$\eta = \frac{1}{N} \sum_{k=1}^{N} \eta_k \qquad (27)$$

where N is the total number of elements or compounds the IK tubes were analyzed for.

The mineral mass flux measured in a cooling tower or downwind of spray modules is expected to depend on the mineral concentration of the circulating cooling water. If it is assumed that the fluctuations of the mineral concentration around a mean value do not affect the drift droplet generation, transport and elimination processes, then a direct relationship between the mineral mass flux and the mineral concentration in the cooling water exists, provided all other operational and meteorological parameters remain constant:

$$\frac{F_{kj\,1}}{F_{kj\,2}} = \frac{C_{k\,1}}{C_{k\,2}} \tag{28}$$

where $C_{k\,1}$ and $C_{k\,2}$ are two different concentrations of the k^{th} element or compound and F_{kj_1} and F_{kj_2} are the associated mineral mass fluxes at the measurement location j. Equation (28) is supported by Reference 14 which shows for a mechanical draft cooling tower that the apparent drift mass concentration, χ'_{kj}, decreases linearly with increasing cooling water concentration, C_k. The apparent drift mass concentration equals the mineral mass concentration, ϕ_{kj}, divided by the dimensionless concentration of the cooling water, C_k/s_{cw}. A fluctuation in C_k by ±25% around a mean value causes, according to Reference 14, a fluctuation in χ'_{kj} by ∓3% around its mean value. If it is assumed that χ'_{kj} is independent of C_k, and since $\bar{v}_{pj}$ is constant and s_{cw} is, as before, assumed to be constant, Equation (28) follows from Equations (21) and (22).

Thus for every measured mineral mass flux data point the associated mineral concentration must be stated. In order to compare mineral mass fluxes measured at different mineral concentrations it is necessary to adjust them to a common value of the mineral concentration. According to Equation (28) this can be accomplished by:

$$F^a_{kj} = F_{kj}\,\frac{C_{k\,Ref}}{C_k} \qquad (gm/m^2\cdot s) \tag{29}$$

where $C_{k\,Ref}$ is a reference mineral concentration, F_{kj} is the mineral mass flux measured at the time when the cooling water mineral concentration was C_k, and F^a_{kj} is the mineral mass flux adjusted to the reference mineral concentration. Other mineral mass emission parameters, e.g. the mineral mass concentration, ϕ_{kj}, the mineral mass emission, Δm_{kj}, and the total mineral mass emission, m_k, can likewise be adjusted:

$$\phi^a_{kj} = \phi_{kj} \quad C_{k\ Ref}/C_k \qquad (gm/m^3) \qquad (30)$$

$$\Delta m^a_{kj} = \Delta m_{kj} \quad C_{k\ Ref}/C_k \qquad (gm/s) \qquad (31)$$

$$m^a_k = \sum_j \Delta m^a_{kj} \qquad (gm/s) \qquad (32)$$

The mineral mass emission fraction, Equation (25) can be rewritten as:

$$\eta_k = \frac{m^a_k \ s_{cw}}{R\ C_{k\ Ref}} \times 100\%$$

$$= \frac{s_{cw} \sum_j \Delta m_{kj} \dfrac{C_{k\ Ref}}{C_k}}{R\ C_{k\ Ref}} \times 100\% = \frac{s_{cw} \sum_j \Delta m_{kj}/C_k}{R} \times 100\% \qquad (33)$$

Thus the mineral mass emission fraction is not an adjusted value, even though the adjusted total mineral mass emission and the reference mineral concentration are used in the numerator and denominator, respectively. Equation (33) follows, for variable C_k, directly from Equation (26).

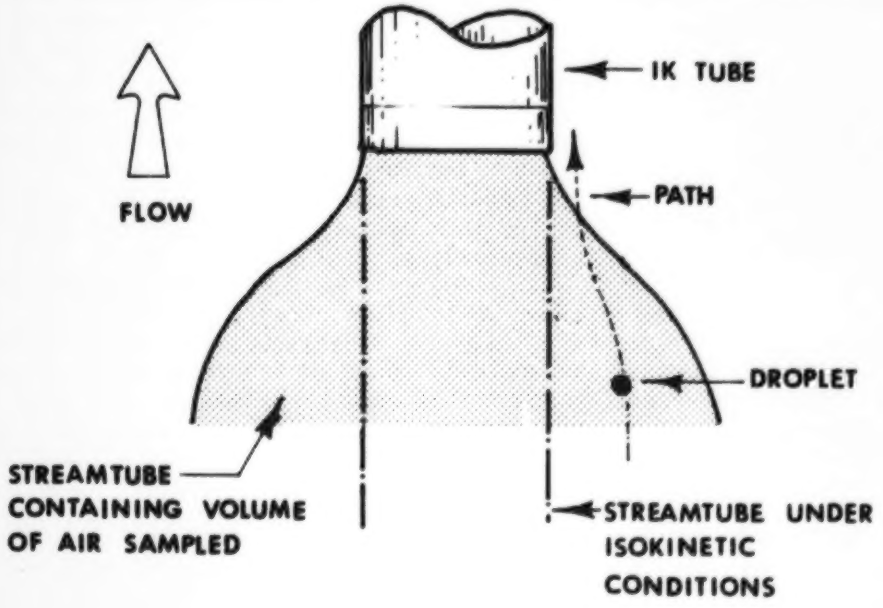
At Turkey Point the sodium and magnesium concentration in the cooling water fluctuated in the order of $\pm$ 20 to 30% of the average value during the entire period of drift testing. Therefore, all mineral mass emission parameters were adjusted to reference sodium and magnesium concentrations as shown in Section VII.

With regard to the accuracy of the heated glass bead isokinetic sampling tubes, Shofner, et. al.[9], concluded from experimental results that if isokinetic conditions are maintained within ±15% for air speed and ±15° angle of attack (angle between tube centerline and air flow vector), the error will be within ±15% of the value of the IK tube which operated under isokinetic conditions. Air speeds which fluctuate about an average should have a compensating effect on the measured parameters according to the following one-dimensional fluid mechanics considerations. If the sampling speed is greater than the local air speed as illustrated in Figure 3a, the cross-sectional area of the streamtube, which envelopes the sampled air, is larger in the upstream direction than it would be under isokinetic sampling conditions. Consequently, the streamlines are curved and droplets, especially larger ones, may cross the streamlines and leave the streamtube due to their inertia, whereas smaller droplets tend to remain within it. Compared to isokinetic sampling, this results in a larger drift and mineral mass flux due to the presence of predominantly smaller droplets in the additionally sampled volume of air. However, the drift mass concentration (mass of drift droplets per unit volume of air) is smaller since some of the larger droplets leave the streamtube. If the sampling speed is less than the local air speed as shown in Figure 3b, the cross-sectional area of the streamtube decreases in the upstream direction. Large droplets outside of the streamtube may cross the streamlines and enter the streamtube, whereas smaller droplets outside of the streamtube tend to follow the streamlines and diverge around the IK tube. Compared to isokinetic sampling, it follows that the drift mass concentration increases due to the intrusion of some large droplets into the streamtube. However, the drift and mineral mass flux will decrease since the sampled air volume is smaller than that acquired under isokinetic conditions as is the number of smaller droplets sampled.

In tests wherein high mineral mass emission fractions[15], [16] (0.08 to 0.12%, as compared to 0.0012%, which was the highest value measured at Turkey Point) were encountered such that it was deemed necessary to place two tubes in series to sufficiently evaporate the droplets, collection efficiencies in excess of 90% were observed for the first tube. When the drift water is not completely captured and evaporated, it can be seen leaving the IK tube and collecting on the walls of the glass connector between the tube and the vacuum hose. This was not observed at Turkey Point, hence it was not necessary to use tubes in series.

Comparison Between PILLS/SP and IK Data

The PILLS/SP techniques measure the droplet size distribution from which the drift mass concentration, Equation (4), can be derived. The IK technique measures the mineral mass flux from which the mineral mass concentration, which is mass of drift mineral residue per unit volume of air, can be derived, as shown in Equation 22. The mass of drift water that contains these mineral residues is obtained by dividing the mass of drift mineral residue by $\overline{C}_k/\overline{s}$. $\overline{C}_k$, with dimensions of mass per unit volume, represents the average concentration of the K^{th} element or compound in the drift droplets of all sizes, and $\overline{s}$ denotes the average density of all drift droplets.


IK TUBE
FLOW
PATH
DROPLET
STREAMTUBE CONTAINING VOLUME OF AIR SAMPLED
STREAMTUBE UNDER ISOKINETIC CONDITIONS

(a) sampling speed is greater than local air speed

(b) sampling speed is less than the local air speed

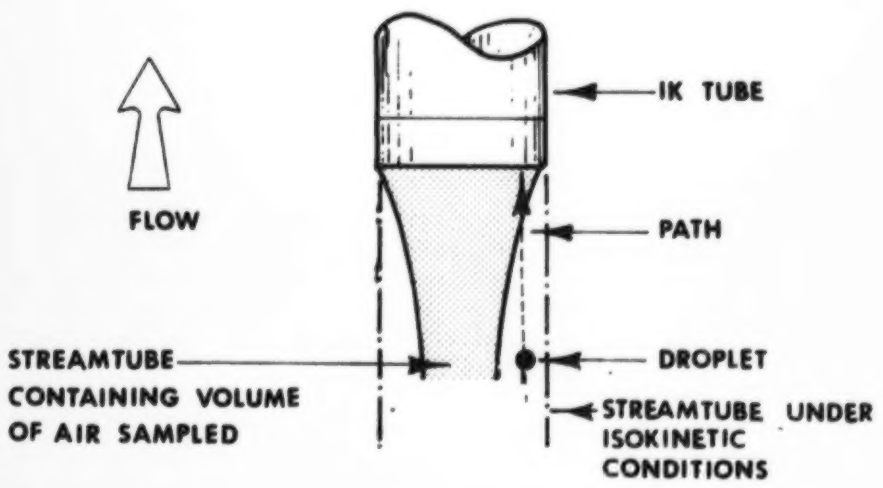

IK TUBE
FLOW
PATH
STREAMTUBE CONTAINING VOLUME OF AIR SAMPLED
DROPLET
STREAMTUBE UNDER ISOKINETIC CONDITIONS

Figure 3. Effects of non-isokinetic sampling.

Thus, the drift mass concentration (mass of drift water per unit volume of air) can be derived from the mineral mass concentration, Equation 22. The respective equations for the drift mass concentration as derived from PILLS/SP and IK measurements are then as follows:

$$\chi_{j\ \mathrm{PILLS/SP}} = \frac{\pi}{6}\sum_i \frac{\Delta N_{ij}}{\Delta d_i\ V_s}\ \Delta d_i\ \bar{d}_i{}^3\ s_i \quad (\mathrm{gm/m^3}) \tag{4}$$

$$\chi_{j\ \mathrm{IK}} = \frac{M_{kj} - M_{Bk}}{V_s \cdot \bar{C}_k/\bar{s}}\ \frac{\bar{v}_{uj}}{\bar{v}_{pj}} \quad (\mathrm{gm/m^3}) \tag{34}$$

The arguments that lead to the assumptions $s_i = s_{cw}$ and $\bar{v}_{pj} = \bar{v}_{uj}$ were already introduced in this section. The first assumption can readily be extended, by the same argument as before, to $s_i = s = s_{cw}$. With these assumptions Equations (4) and (34) reduce to

$$\chi_{j\ \mathrm{PILLS/SP}} = \frac{\pi}{6}\ s_{cw} \sum_i \frac{\Delta N_{ij}}{\Delta d_i \cdot V_s}\ \Delta d_i\ \bar{d}_i{}^3 \quad (\mathrm{gm/m^3}) \tag{35}$$

$$\chi_{j\ \mathrm{IK}} = \frac{M_{kj} - M_{Bk}}{V_s \cdot \bar{C}_k/s_{cw}} \quad (\mathrm{gm/m^3}) \tag{36}$$

If all quantities that enter into these equations were known then both drift mass concentrations should agree within the ranges of accuracy of the measurements which were given before. The only unknown quantity in Equation (36) is $\bar{C}_k$. A natural assumption is that the average mineral concentration of the drift equals the mineral concentration of the cooling water: $\bar{C}_k = C_{k\ cw}$. With this assumption, Equation (36) becomes

$$\chi'_{j\ \mathrm{IK}} = \frac{M_{kj} - M_{Bk}}{V_s \cdot C_{k\ cw}/s_{cw}} \quad (\mathrm{gm/m^3}) \tag{37}$$

where $\chi'_{j\ \mathrm{IK}}$ represents now, due to the assumption on the mineral concentration, a drift mass concentration associated with the IK technique alone.

Historically, the results of IK measurements were often expressed in terms of $X'_{j\ IK}$ which was then compared to $X_{j\ PILLS/SP}$. Such comparisons yielded usually that the ratio of $X'_{j\ IK}/X_{j\ PILLS/SP}$ is larger than one. For the Turkey Point cooling tower data this ratio is, in the average, about 3, and for the spray module data it is about 18, with a range of 2.7 to 70.

The reason for this deviation of the ratio from unity is believed to be primarily due to droplet evaporation which increases the droplet's mineral concentration. The assumption of $\bar{C}_k = C_{k\ cw}$ would thus result in too large a value for X_{jiK}. The increase in the droplet's concentration depends on several parameters like droplet diameter, kind of solute and its concentration in the droplet, the relative humidity of the surrounding air, the residence time of the droplet in the air, etc. The following simple examples should demonstrate the order of magnitude of possible droplet mineral concentration increases. The particular numerical values of the relative humidity and salt concentrations that are used in the examples are not intended to be representative for Turkey Point.

The mineral concentration is related to the droplet diameter by:

$$C_E/C_I = (d_I/d_E)^3 \qquad (38)$$

where C is the droplet salt concentration, d is the droplet diameter and the subscripts I and E represent the initial and the equilibrium states, respectively. The term "equilibrium" refers to the condition that the droplet surface vapor pressure is equal to the vapor pressure of the surrounding air, which implies that no further droplet evaporation occurs. If the relative humidity is 90% and the initial salt concentration is 1500 ppm, then one can calculate the ratio of equilibrium to initial concentration:

$$C_E/C_I = 64 \qquad (39)$$

From Equation (38) follows $d_I/d_E = 4$. For $C_I = 30{,}000$ ppm and the same relative humidity

$$C_E/C_I = 5 \text{ and } d_I/d_E = 1.7 \qquad (40)$$

These are the concentration increases for 90% relative humidity. They are larger for lower relative humidities.

Since the rate of evaporation depends on the droplet diameter such that smaller droplets evaporate faster than larger ones, the smaller droplets will usually reach higher concentration ratios than the larger droplets. The Marley Company[17] conducted some preliminary calculations for a mechanical draft cooling tower which indicate that drift droplets smaller than about 50 μm in diameter could possibly have increased mineral concentrations whereas those larger than 50 μm have about the same mineral concentration as the cooling water. Of course, the final mineral concentration of a drift droplet depends primarily on the size of each individual droplet and on the relative humidities it encounters during the period of time of its trajectory from the fill section to the exit area of the fan stack. Thus the number of 50 μm is quoted here in order to roughly quantify the "small" droplets whose concentration may be increased by evaporation, and the "large" droplets whose concentration remains more or less unchanged.

If the mass fraction of the small droplets in the drift emission increases, the average mineral concentration, $\overline{C}_k$, should also increase. As a consequence, the ratio $X_j|_{IK}/X_j|_{PILLS/SP}$ would likewise increase. There are other possible reasons that may contribute to the deviation of the ratio from unity. The most important is that additional minerals from atmospheric particulate pollution may not be scrubbed out entirely in the cooling tower and reach therefore the IK tube. Both arguments, the increased droplet mineral concentration and the insufficient removal of particulate pollution, apply especially to drift measurements on spray modules. If the test equipment is located at some distance downwind from the modules the drift droplets travel through either ambient air or a plume whose relative humidity has already been reduced by entrained air. Thus it is expected that all droplets reach, in general, higher concentrations than they would in a cooling tower.

In summary, drift parameters which are calculated from mineral mass emission data with the assumption that the drift droplet mineral concentration is the same as that of the basin water are larger than the drift parameters obtained from droplet size data. The main reason for this is believed to be the increase of the average mineral concentration of the drift over the mineral concentration of the cooling water, caused by evaporation. Small droplets, probably smaller than 50 μm in diameter, are believed to contribute primarily to this increase in mineral concentration. Consequently, the use of this assumption for obtaining drift values from mineral mass emission measurements is a somewhat dubious proposition. A method for measuring individual drift droplet concentration or a different set of assumptions is needed before the PILLS/SP and the IK data can be compared.

As a consequence, the data which were obtained by the PILLS/SP techniques and by the IK technique are not consolidated. Whereas the PILLS/SP technique yields data on the liquid drift emission (droplet size, drift water emission, etc.), the IK technique yields data on the drift mineral emission.

OTHER SUPPORT EQUIPMENT FOR DRIFT MEASUREMENTS

A Gill propeller anemometer Model 27100 was used to measure air speed both on the tower and on the barge. Due to its cosine response, it measures the velocity component parallel to its axis of rotation. This anemometer was used successfully in other mechanical draft cooling tower tests conducted by ESC. During the Turkey Point winter test, however, the four blade molded polystyrene propellers (9" diameter) disintegrated during operation at a disturbingly high rate although the highest speed they encountered was only half of their maximum rated speed. The dynamic loading on the blades caused by the rapid updraft velocity changes is believed to be the cause of the frequent blade failures. During the summer test a much stronger experimental three blade propeller (designated "ABS") was used successfully with no breakage. The Gill anemometer provides a voltage output that is negative or positive depending on the direction of blade rotation. The voltmeter that was generally used as output displayed only positive voltages. For this reason, negative voltages and thus negative updraft velocities were not measured and are therefore not shown in the updraft velocity profiles in the data section. The same holds for the velocity distribution data since the PHA does not accept negative voltages.

A modified Yellow Springs electronic psychrometer, Model 3314, was mounted on the instrument package to provide dry bulb temperature and wet bulb depression. Measuring wet bulb and/or dry bulb temperatures in cooling tower environments is a nontrivial task. Due to the presence of liquid water, the dry bulb is usually wet. Initially both the dry bulb and the wet bulb sensors were used in the cooling tower exit plane, but since a depression was never detected, the water supply to the wet bulb sensor was discontinued. On the barge, however, the psychrometer was used with a dry bulb and wet bulb sensor, and wet bulb depressions of up to 7°C were observed.

A Weather Measure wind vane, Model No. W120-D, was installed on the barge in order to give an indication of the percentage of run time the wind came from the direction of the spray modules. To obtain this data, the output voltage of the vane was fed into the pulse height analyzer.

AIRBORNE PARTICLE SAMPLER AND DEPOSITION SAMPLER

The most conventionally used parameters for expressing atmospheric salt loadings are the near-ground level air salt concentration, ϕ ($\mu g/m^3$), and the near-ground level deposition flux, d_F ($kg/km^2 \cdot mo$). "Near-ground level" refers to the fact that the collectors were not located at ground level but at a specified height above grade. This minimizes contamination from sources like plants and animals. At Turkey Point, where both the air salt concentration and the air salt deposition flux were measured, the salt concentration sampler and the deposition sampler were located approximately 3.4 m and 3.8 m above grade, respectively.

Of those instruments which can be employed to measure the near-ground level air salt concentration, the one used at Turkey Point was the Airborne Particle Sampler (APS). The APS, which employs the principle of inertial impaction as the collection mechanism, was designed to measure airborne sea salt concentrations independent of wind speed, wind direction or relative humidities typical for coastal regions. "Coastal region" implies here that the relative humidity is typically higher than approximately 40%. For relative humidities much below this figure, salt particles could evaporate to dry crystals[18] which may impair the APS collection efficiency.

Figure 4 shows an operating APS head of a station at Turkey Point. The sampling head is bearing-mounted and rotates due to its wind vane such that the axis of rotation of the motor shaft is parallel to the wind direction. This minimizes the effects of wind speed or direction on the sampling rate and collection efficiency of the collector. On the upwind side of the motor is the mesh support with a pair of woven polyester meshes as collection elements. This material has been proven in field experiments to possess good mechanical and chemical properties (low sodium background, for example) and is easily handled in the field. A rotation counter, visible between the mesh supports and the motor, permits accurate measurement of the total number of revolutions made during the testing period. This insures accurate calculation of the sampled air volume. On the downwind side of the motor is a small fan which moves unsampled air past the meshes even under calm wind conditions.

Although an APS unit samples about 90 m^3 of air per hour, the power consumption of about 24 W is sufficiently small to allow 10 to 12

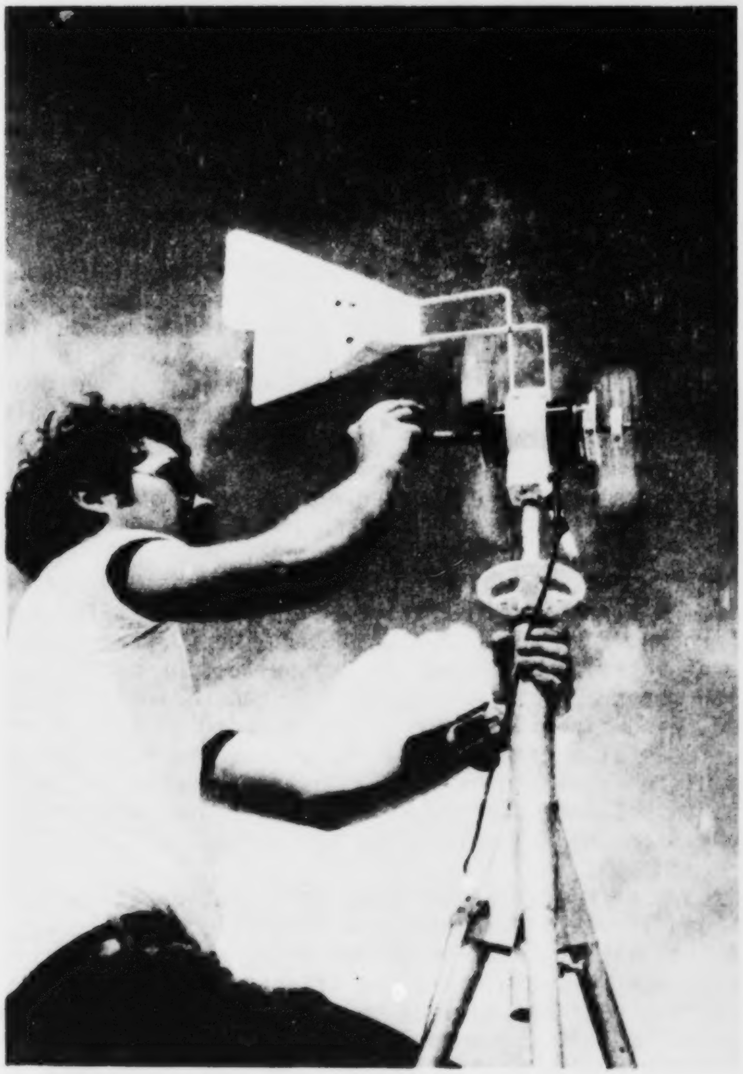


Figure 4. Airborne Particle Sampler head of one of the Turkey Point stations. David Rutherford, ESC Field Engineer, checks the unit's RPM.

hours of operation with two standard automotive batteries (the run times at Turkey Point were usually between 1 to 4 hours). This is an important feature which facilitates field operations. If a 110 V AC power supply is available, the APS unit can also be operated from it. Reference 19 describes the theoretical foundation, including collection efficiency, and the operational features of the APS system in more detail.

High volume samplers with comparable air flow rates, which are also used for salt concentration measurements, consume an order of magnitude more power than an APS unit and have to be either operated from a motor generator or from standard 110 V power supplies. Moreover, the mounting and removal of the filter papers is a more involved task than that of the meshes due to the greater size of the filter papers. Contamination of the filter papers is therefore more likely. Also, for the same data quality, the analysis of filter papers is twice as costly as the analysis of meshes. For these reasons the APS system was selected for the Turkey Point salt concentration measurements.

At Turkey Point the APS units measured as a basic parameter the air sodium concentration, ϕ_{Na}:

$$\phi_{Na} = \frac{M_{Na} - M_{B\ Na}}{V_s} \quad (\mu g/m^3) \tag{41}$$

where M_{Na} is the mass of sodium stripped from the mesh pair, $M_{B\ Na}$ is the average procedural background of the mesh pair and V_s is the sampled air volume. For every day of operation of the APS units, one procedural background was obtained by the following procedure: The two meshes which are shipped and stored as a pair in a 50 mm (2") diameter petri dish, are removed from the petri dish and mounted to the mesh supports of the APS head. Immediately after mounting they are both removed from the head and transferred back into the petri dish and, after shipping to the laboratory, analyzed for sodium. Thus, the procedural background reflects the sodium background of the mesh pair plus additional sodium contamination that occurs during the handling of the meshes before and after the sampling process. An average of these procedural backgrounds is entered into Equation (41) as $M_{B\ Na}$. For Turkey Point, this average value varied between 2.7 and 8.5 μg per mesh pair.

The salt concentration is obtained from the sodium concentration by multiplication with 3.267. This factor is the inverse of the sodium mass fraction of the total dissolved solids in sea water published in Table B-2 of Reference 20. This factor may vary in time and could also depend on the source of the airborne sea salt. For instance, when the wind comes from the east, sources of airborne sea salt may be the Atlantic Ocean, Biscayne Bay, and, if the wind is strong enough to cause wave action on the cooling canal system, the cooling canals themselves. Since the factor is, however, used as a constant, the so determined sea salt concentration is called "apparent salt concentration." Thus the working equation for the apparent salt concentration is

$$\phi_{salt} = 3.267 \times \frac{M_{Na} - M_{B\ Na}}{V_s} \quad (\mu g/m^3) \tag{42}$$

The quality of the APS sampling procedure was insured by the following steps:

1. One procedural mesh background sample was taken per day of operation and analyzed for sodium. This background contains the mesh background which is addressed under 2, and the sodium contamination due to handling of the meshes. A complete list of the results of the chemical analyses of the Turkey Point procedural mesh backgrounds is part of Appendix C.

2. After meshes were chemically analyzed and cleaned, about 6% of them were resubmitted to the laboratory in order to determine their sodium background. Again, a complete list of the results of the chemical analyses of these meshes is part of Appendix C.

3. The motor rotations per minute were checked at the start and end of each APS operation. Reduced motor rotations per minute decrease the collection efficiency of the meshes[19].

The cylindrical objects supported by the APS units shown in Figure 6 are deposition samplers. They consist of a cylinder which is open at both ends and which acts as a stilling chamber. Inside the cylinder a polyethylene funnel is mounted on which the salt particles deposit by gravitational settling. Procedurally, a deposition sampling run is started by placing a cleaned funnel into the stilling chamber and securing a cleaned polyethylene bottle to the funnel neck. At the end of a run, the inside of the funnel is washed with distilled water that drains into the bottle. The amount of distilled water used for funnel cleaning was in the range of 100 to 150 ml. The bottle with the strip solution is then separated from the funnel and shipped to the laboratory for chemical analysis.

At Turkey Point, the run time for about 80% of the runs was approximately 24 hours and for the remaining 20% either approximately 48 to 72 hours. The longer run times occurred on weekends or over holidays.

The deposition sampler measures the sodium deposition flux from which, by multiplication with 3.267, the apparent sea salt flux is derived:

$$d_{F\ salt} = 3.267 \times \frac{M_{Na} - M_{B\ Na}}{A_S \cdot t_S} \quad (kg/km^2 \cdot mo) \qquad (43)$$

where t_S is the sampling time and A_S is the sampler area which is here the horizontally projected area of the funnel entrance. $M_{B\ Na}$ is an average procedural sodium background which was determined as follows. At the end of a deposition run, after the polyethylene bottle with the strip solution had been removed from the funnel, the funnel was cleaned with distilled water and another bottle was mounted to the funnel neck. Then the inside of the funnel was washed again with distilled water and the strip solution submitted for chemical analysis. The mass of sodium found in this strip solution is attributable to the handling of the funnel and bottle, to the sodium contamination inside the bottle, and to the distilled water. This procedure establishes, therefore, a procedural background. At Turkey Point, the average procedural background was found to be 5 μg.

INSTRUMENTATION SUMMARY

In summary, the measuring equipment used by ESC during the Turkey Point test, as discussed previously in this section, consisted of:

1. a PILLS II-A system with pulse height analyzer from ESC,
2. two ESC sensitive paper (SP) machines,
3. a heated glass bead isokinetic (IK) sampling system from ESC,
4. a maximum of nine ESC Airborne Particle Sampling (APS) units with deposition samplers,

5. a Gill propeller anemometer, Model 27100, from R. M. Young Co.,
6. a Yellow Springs electronic psychrometer, Model 3314, and
7. a Weather Measure wind vane, Model W120-D.

SECTION V

METEOROLOGICAL DATA ACQUISITION SYSTEM

A system for the continuous monitoring of ambient meteorological conditions in the vicinity of the cooling tower and spray modules was put into service early in February 1974. This meteorological data acquisition system was originally installed to complement the intensive drift tests on the cooling tower and spray modules during the months of February and March 1974 although it was used during later testing as well.

The meteorological tower was installed by ESC approximately 50 m east of the cooling tower. The distance of 50 meters was chosen so that meteorological instruments would be near enough to the cooling devices to measure local ambient conditions but far enough upwind from the cooling tower to insure that measurement of wind speed and direction would not be interfered with. A position east of the cooling tower was chosen because winds at Turkey Point were expected to come predominately from the east. The wind speed anemometer and the wind direction vane were installed at the top of the 10 m tower. A mechanically-aspirated psychrometer which provided dew point and dry bulb temperatures and a Yellow Springs dew point sensor which provided dew point and dry bulb temperatures were mounted on the tower at a height of about 2 m. A probe for monitoring the canal water temperature was attached to the power cable leading to the spray modules. Later, at the end of February, 1974, a pyranometer for measuring solar radiation was installed on the roof of the switch house 23 m east of the cooling tower. The output signals from the monitoring devices were routed to an eight track strip chart recorder located in the switch house. The readings for wind direction, wind speed, dry bulb temperature, dew point temperature, and solar radiation were recorded individually on separate channels of the recorder. Readings for wet and dry bulb temperatures from the psychrometer and canal water temperature were fed through a scanner such that all three values were consecutively recorded over a set time interval on a single recorder channel. These values were also displayed on a meter which was attached to the scanner.

All monitoring instruments were supplied by EPA with the exception of the eight track strip chart recorder which was supplied by ESC. The equipment was operated daily during the winter test (February and March 1974). This practice was continued, although not required, until June 22, 1974. Monitoring of the meteorological data was resumed during the summer test (July 19-24, 1974).

Each morning, after the instrumentation had warmed up, the calibration of each recording channel was checked by means of the independent meter displays and readjusted if necessary. All pertinent information, such as starting time, channel sensitivities, and scales, were written on the charts. The three temperature sensors for dry and wet bulb temperature (both part of the psychrometer) and canal water temperature were fed into a scanner, as mentioned above, and consecutively recorded on one channel of the strip chart recorder. The signal conditioner electronics were part of the scanner, i.e. one signal conditioner served all three temperature sensors. This caused a problem since only one sensor signal could be calibrated correctly and a decision was made to calibrate the wet bulb temperature sensor. The canal water temperature showed subsequently the largest discrepancy between recorded and actual value as determined with a mercury-in-glass thermometer with a graduation of 1/10°C. For this reason the canal water temperature was often measured with such a thermometer. During the cooling tower test, for instance, the water temperature in one of the hot water basins, which equals the temperature of the canal water, was measured for each drift measurement position.

Even though the wet bulb temperature was calibrated with an accuracy of about ±0.2°C, the calibration was not stable. As a result the recorded values of all temperature sensors showed a deviation of 0.5° to 2.5°C from the actual values, and the recorded values were consistently larger than the actual ones.

Another difficulty was encountered with the wind speed anemometer whose readout operated only sporadically. Yet, frequent checks and services made it possible to obtain usable data. The dew point sensor became operational only toward the end of March 1974. However, intermittent loss of power on site made the use of this sensor cumbersome since its probe required baking for a half-hour period after each power interruption. Once, on March 27, the relative humidity, as determined from dry bulb and dew point temperatures, was compared to the relative humidity determined from dry bulb and wet bulb temperatures. The agreement was better than 2% at a relative humidity of about 74%.

Additionally, difficulties were encountered when the meteorological equipment was restarted for the summer test in July. The mechanically-aspirated psychrometer was inoperable due to heavy corrosion of the motor coil and fan blade shaft. However, the entire motor assembly was removed and the wind provided henceforth the aspiration of the wet bulb sensor wick. The wind direction sensor appeared to be operating well mechanically, but some problem in the electrical output was encountered and could not be corrected in the field. Similar problems with the canal water temperature probe were observed and its use was discontinued. In addition, one of the radiation shields of the dew point sensor was broken during the interim period between the winter and the summer tests.

Florida Power and Light Company routinely acquires meteorological data from instruments located at the power plant. These data include wind speed and direction at two vertical levels, ambient temperature at two vertical levels, barometric pressure, relative humidity and rainfall. FP&L has agreed to the release of these data which are now available upon request from the Technical Information Section, National Environmental Research Center, Control Systems Laboratory, Research Triangle Park, North Carolina 27711.

The data obtained at the 10 m meteorological tower were transcribed from the strip charts to tables by EPA, Research Triangle Park. However, these data still have to be checked, which is especially important in light of all the instrument problems encountered. They may be available upon request at a later time.

SECTION VI

SAMPLING OF AIRBORNE SEA SALT FROM COOLING DEVICE SOURCES AND IN THE AMBIENT ATMOSPHERE

In order to evaluate the environmental acceptability of a proposed evaporative salt water cooling device with respect to salt drift, one of the present approaches is as follows[21]. Drift emission characteristics and meteorological data are substituted into one of the presently available drift transport models to predict the quantity of salt drift mineral residue downwind of the cooling device. These source contributions are then compared to measured ambient salt loadings in order to determine whether the predicted cooling device contributions increase significantly the airborne salt levels in the environment of the cooling device. The quantification of "significant", which is addressed in Reference 22, and the acquisition of ambient salt level data are the two areas of primary importance in this approach.

Contrary to this approach, the objectives of this study were to measure both the ambient salt loadings and the contributions of each of the cooling devices to the ambient salt loadings. In particular, the objectives were to obtain:

1. measurements of the ambient airborne sea salt levels at the Turkey Point site. A statistical analysis of these data, which is extraneous to this contract, should determine, for example, whether an inland gradient in the ambient sea salt levels exists, and what the average seasonal salt levels and ranges of fluctuations are;

2. simultaneous measurements of airborne sea salt levels upwind and downwind of each of the cooling devices. Statistical analysis of these data, which again is outside the scope of this contract, should determine the extent of the contributions to the airborne sea salt level from the cooling devices.

Previous experience gained at other ambient salt monitoring programs, for instance at Forked River and Atlantic City, both in New Jersey, indicated that airborne salt concentration and deposition flux levels exhibit order of magnitude variations with respect to wind speed, direction, and other meteorological parameters. Seasonal effects may also influence the airborne salt levels, and the degree of influence may also depend on the latitude of the site. Thus, in order to obtain ambient base line data for environmental acceptability studies, an ambient monitoring program must be established and operated over an extended period of time such as a year or longer.

The atmospheric salt monitoring program at the Turkey Point site can be conveniently broken down into two sections:

1. ambient measurements, and
2. exploratory measurements of the source contributions from the cooling devices.

AMBIENT AIRBORNE SEA SALT MEASUREMENTS

The ambient airborne salt monitoring program was started on August 24, 1973, with samplers located at stations 1 through 6 (see Figure 5). Each station was equipped with an Airborne Particle Sampler for airborne sea salt concentration measurements, and a deposition sampler for sea salt deposition flux measurements. The stations were arranged approximately along an east-west line for two reasons:

1. One of the goals was to determine whether a measurable gradient in the airborne salt concentration exists between the shore and inland. Since the shore line of Biscayne Bay runs approximately north-south at the test site and in its vicinity, an east-west array of sampler stations was desireable. The fact that the prevailing wind direction at the site is from the east is a fortunate coincidence.

2. Accessibility is a serious problem at the Turkey Point site and the road along the feeder canal which extends in an east-west direction provides access to convenient station locations. In order to be able to situate stations north or south of the cooling tower site the cooling canal system or the swamp has to be penetrated.

Ambient salt concentration data that were acquired at Forked River, New Jersey, for the General Public Utilities,[23] show, for onshore winds, the existence of a large inland gradient: within 50 meters of the shoreline of the Atlantic Ocean the average sea salt concentration

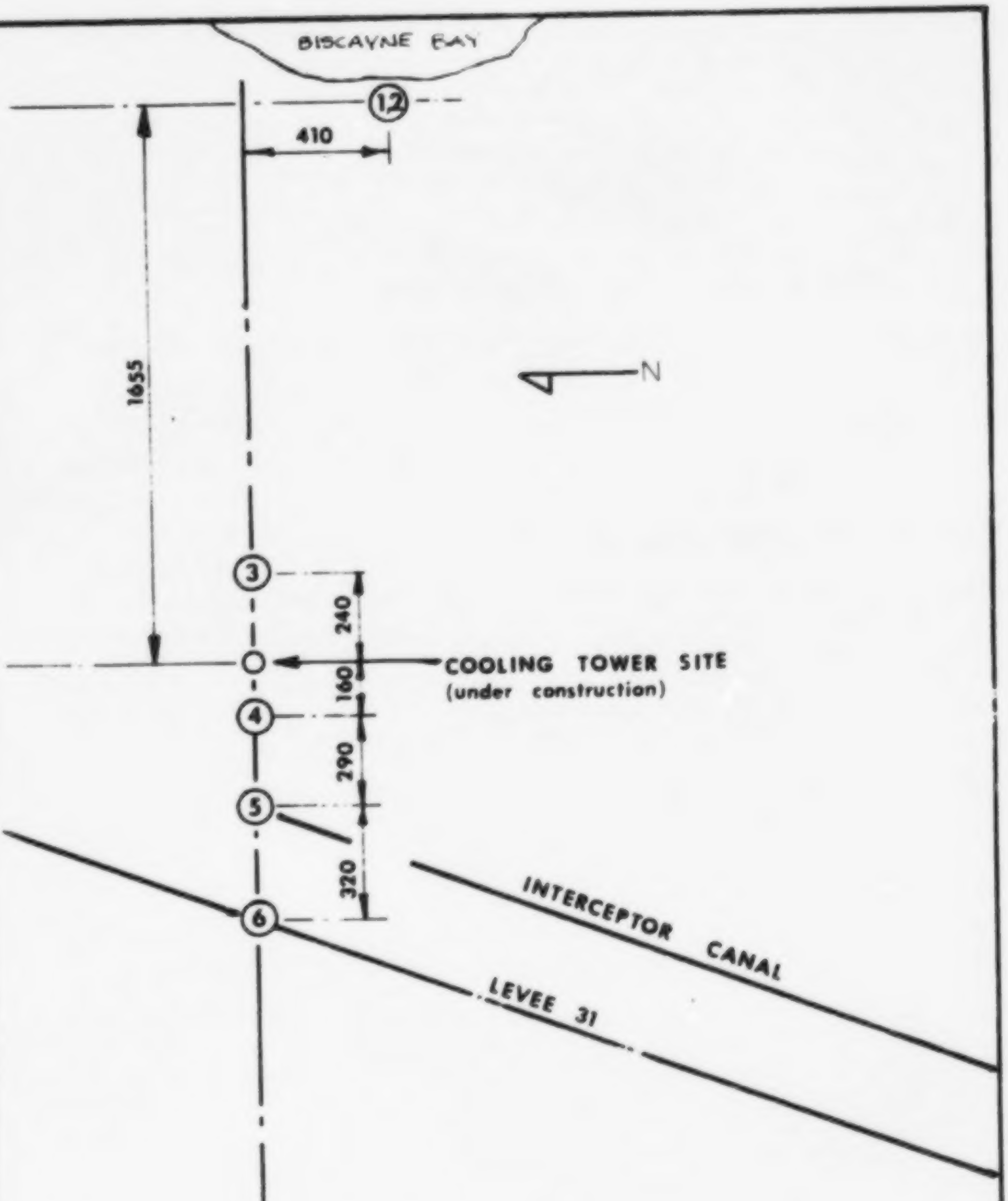


Figure 5. APS station locations for monitoring ambient air salt loadings. August 1973 - January 1974. Distances in meters.

is about 25 $\mu g/m^3$ and it decreases rapidly to about 5 $\mu g/m^3$ at a distance in excess of 35 km from the shore. A limited examination of the Turkey Point ambient salt concentration data did not reveal the existence of an inland gradient, but a final conclusion on this is reserved for the data analysis which is currently being conducted by the Adapt Service Corporation as mentioned in Section I. The absence of a large inland gradient, however, indicates that the Turkey Point site, although it is located on the shore of Biscayne Bay, may actually be an inland site. This is supported by the fact that Key Elliott is located about 11 km offshore and that the primary salt particle generation may take place at the ocean surface off Key Elliott. However, it was observed that onshore winds in excess of 14 to 18 km/hr generate white caps on Biscayne Bay. Under this condition the bay may be a sufficiently strong source of sea salt particles to cause an inland gradient of the ambient sea salt concentration at the Turkey Point site.

Stations 1 and 2, which are shown in Figure 6, were located about 15 meters from the shore of Biscayne Bay and within 4 meters of each other. These two stations were used for precision runs, i.e., simultaneous runs were conducted to allow unambiguous comparison of the results. A "Precision Run Error" was defined for this purpose:

$$\text{Precision Run Error} = \left(1 - \frac{\phi_{\text{smaller value}}}{\phi_{\text{larger value}}}\right) \times 100\% \tag{44}$$

Between 8/25 and 12/6/73 a total of 65 precision runs were obtained which yielded an average precision run error or 7% and a standard deviation of the precision run error of about 11%. It should be noted that the two APS stations were the same in design and differed from each other only within the manufacturing tolerances. The stations were also operated in the same way as the other stations; they did not receive any preferential or additional attention. The data acquired by the two stations do not show any apparent bias, i.e., the larger of the ϕ-values was acquired randomly by one of the two machines. However, only the detailed data analysis which is currently conducted by the Adapt Service Corporation will answer this point conclusively.

Precision runs were also performed with the deposition samplers which are the cylindrical objects attached to the APS stations shown in Figure 6. Forty precision runs were conducted which yielded an average precision run error of 23% and a standard deviation of error of about 20%. The "Precision Run Error" is defined as in Equation (44) substituting the salt deposition flux d_f for the air salt concentration, ϕ.

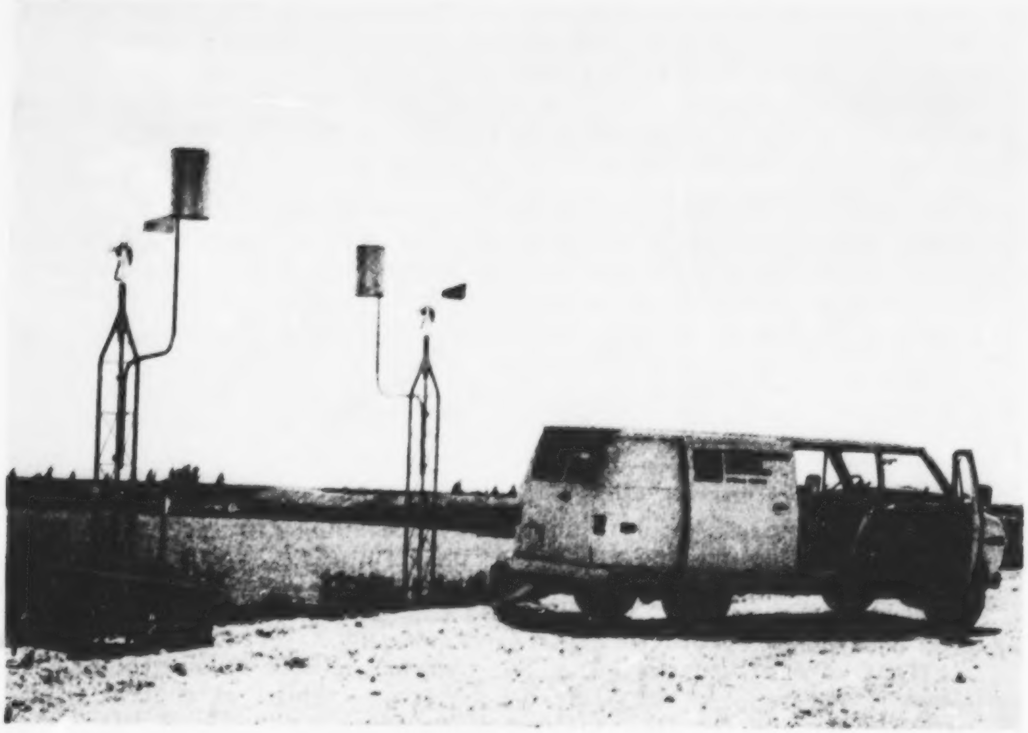


Figure 6. Airborne Particle Sampler stations #1 and #2 at the Turkey Point site. These stations were used for the precision run experiment. The body of water is part of Biscayne Bay.

When the ambient salt sampling program started on August 24, 1973, and during the following two month period, heavy trucks and loading equipment were operated at a distance of about 1200 m southeast of the cooling tower. At that location coral rock from huge 10 m high piles was loaded on trucks and hauled away. The loading operation and maneuvering of the trucks caused dust and the possibility existed that the dust would contaminate the APS meshes and deposition samplers. A project was therefore initiated with the objective to determine the mass fraction of the sodium collected by the APS meshes that was attributable to dust contamination. Chemical analyses of an ocean water sample and two dust samples, one collected from the coral rock piles and the other from the road bed, yielded aluminum and silicon as suitable dust tracer elements. Furthermore, the sodium availability from the dust samples, i.e., mass of sodium per unit mass of dust, was determined by subjecting a known mass of dust to the mesh washing process. Subsequently 5 meshes exposed at stations 1 to 5 on August 25, 1973, Run #3, during southeasterly winds, were analyzed for sodium as usual and, additionally, for both tracer elements. The largest dust contamination, 10 μg, was found on the mesh pair of station 3 which was downwind of the loading area on that day. The meshes of station 4 which is located 400 m west of station 3 received only 0.3 μg of dust, and all other mesh pairs less than 0.1 μg. A maximum sodium contribution from dust was then calculated by means of the sodium availability mentioned above. Even for station 3, whose meshes collected 10 μg of dust, the mass of sodium attributable to dust was only 0.02 μg or 0.003% of the collected mass of sodium. It was therefore concluded that the effect of dust on the ambient sea salt concentration measurements was negligible. The results of the chemical analyses conducted for this project are part of a brief report submitted by Stewart Laboratories, Inc., which is contained in Appendix I.

The cooling tower was under construction during the entire ambient sea salt sampling program. The cold water collection basin and thus the necessary excavations for its construction were already completed before the start of the program. Until November 1973 the tower was assembled from prefabricated parts, and this activity was without any noticeable dust generation. However, it should be kept in mind during the data analysis that especially stations 4 and 3 which were located 160 m west and 240 m east of the tower may have been, at times, subjected to dust.

SEA SALT MEASUREMENTS DURING COOLING DEVICE OPERATION

After the spray modules were installed into the cooling canal system in December and the cooling tower was completed in January, airborne sea salt measurement during cooling device operations could be initiated. The array of sampling stations was rearranged in order to increase the probability of obtaining simultaneously airborne sea salt level data upwind and downwind of the operating cooling device. Station 1 was moved to station 11 and station 2 to station 7. Three additional sampling stations were located at stations 8, 9, and 10, increasing the total number of APS and deposition samplers from 6 to 9. Figure 7 shows the location of stations 3 to 9 relative to the cooling tower. Station 11 was mounted on a barge such that its position with respect to the cooling devices could be easily changed within the limits of the cooling canal system. However, such need did not arise and the barge was anchored on the north shore of the feeder canal half way between stations 4 and 5 where it remained for the entire sampling program.

Due to the scarcity of accessible station locations at the Turkey Point site, the total number of available stations, and the fact that winds out of the eastern quadrant have the highest frequency of occurrence, this new array of station locations was considered optimal.

Airborne sea salt measurements during the operation of one of the cooling devices were initiated on January 31, 1974. Until the end of the winter test, March 31, the operation of the cooling devices was governed by the drift test requirements. After March 31 it was planned to operate henceforth one cooling device 24 hours a day for a week, then the other one for the same period of time, and so forth, in this alternating fashion. The implementation of this plan required shielding the transformer from the spray modules' salt drift. The transformer which provided power for both cooling devices was located 24 m north of the nearest spray module. When the wind came from the south, the transformer was in the drift plume of the spray modules. Under such conditions it shorted out twice as noted in the operational log of the cooling devices, Appendix B. After a protective shield had been constructed on April 17, such problems were no longer encountered. Subsequently each cooling device was operated continuously for a week every other week, and airborne salt measurements were obtained at an average weekly rate of six runs, i.e. quasi-simultaneous operations of all sampler stations.

MEASUREMENT PROCEDURE

One run consisted usually of the quasi-simultaneous operation of all sampler stations, and the acquisition of meteorological and quality control data. The term "quasi-simultaneous" expresses the fact that simultaneous station operation is only approached as much as possible under the constraint of a sequential station set-up procedure. Thus, all stations were set up one after the other and later taken down in

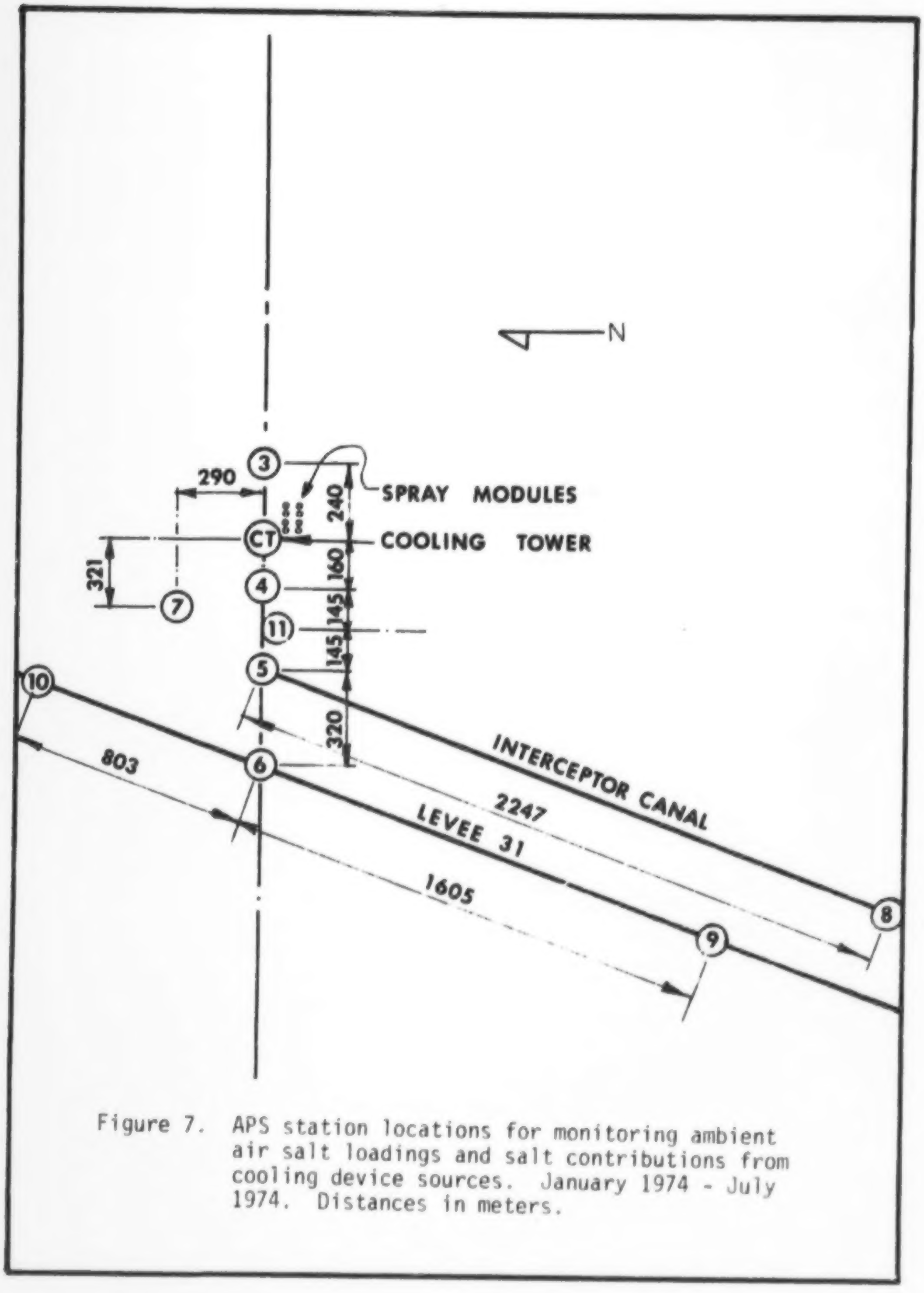


Figure 7. APS station locations for monitoring ambient air salt loadings and salt contributions from cooling device sources. January 1974 - July 1974. Distances in meters.

the same sequence. The meteorological data consisted of wind speed, wind direction, dry bulb and wet bulb temperature, and were acquired at each station at the start and end of its operation. For each run the quality control data consisted, for the APS units, of one procedural mesh background sample, and for the deposition samplers of one procedural funnel background sample and a distilled water sample.

The procedure of operating a station which was the same for all stations was as follows. Sequentially, the deposition sampler was always set up first. In order to obtain the sample the inside surface of the funnel was rinsed with about 100-150 ml of distilled water which was collected by a sample bottle at the funnel neck. The deposition sampler was then set up for the next sampling period which usually lasted for about 24 hours. The next step was to set up the Airborne Particle Sampler. First, two battery boxes, each containing one standard 12 V automotive battery, were placed next to the APS tower. Then the APS head, which belonged to the particular station, was placed on the APS tower. During non-operation all APS heads were stored in the van to keep them clean and in good operational condition. Next, the sampling arm which supported one sample mesh on each end was cleaned with distilled water, and the meshes were removed from the petri dish container and mounted to the arm by means of a cleaned pair of tweezers. The sampling arm was then mounted to the motor shaft of the APS head. After the revolution counter reading had been recorded, sampling was initiated and the revolutions per minute of the motor shaft were measured and also recorded. This concluded the set up procedure of the APS unit. The next step was the acquisition of the meteorological data. The wind direction was read directly from the position of the sampling head that weather-vanes around its vertical axis. The wind speed was measured for usually one minute by means of an accumulative vane anemometer. Dry bulb and wet bulb temperatures were determined with a sling psychrometer. This completed the set up procedure of one station. The shut down procedure which took place one to four hours later consisted of measuring and recording the revolution counter reading, removing the meshes from the sampling arm and placing them back into the petri dish container, removing the APS head and placing it into the storage rack in the van, and collecting the two battery boxes. Then the same meteorological data as described before were gathered. This concluded the shut down procedure.

QUALITY CONTROL DATA

The procedural and funnel background samples were taken once per day at one of the stations, during source contribution measurements usually at an upwind station. All procedural mesh background data are listed in Appendix C-2. Averaged values which were between 2.7 and 8.5 μg were entered in Equation (41). As stated before, the procedural mesh background reflects the sodium background of the mesh pair and the additional sodium contamination that occurs during the handling of the meshes before and after the sampling process.

The sodium background of meshes, (called "mesh background" or, by Stewart Laboratories, "blank") was determined from time to time by resubmitting meshes for analysis which just had been analyzed and cleaned. The mesh background represents the sodium content of a mesh pair in an unopened petri dish. These values are listed in Appendix C-3. One to two μg was judged as an acceptable mesh background value for the Turkey Point sampling program. Since larger values were encountered in October 1973, steps were taken to rectify the problem. The petri dishes of the meshes were exchanged for new ones, and the meshes were more carefully stripped and cleaned. Later, in mid-April, Stewart Laboratories started to use an ultrasonic cleaner which eliminated the problem. Appendix C-3 contains a letter report of Stewart Laboratories which states results of mesh cleaning with the ultrasonic cleaner.

FORMATS FOR DATA PRESENTATION

The data are presented in two appendices. Appendix C contains all air salt concentration data including the procedural background and mesh background data and Appendix D all salt deposition flux data. Appendix B contains the cooling tower and spray modules operations log which lists the date and times of cooling device operations.

Definition of column headings and other pertinent data contained in the APS section (Appendix C) is as follows:

ST # - identification of APS sampling station location

PHI - apparent atmospheric sea salt concentration, $\mu g/m^3$

C - comment code:

0 - good run

1 - sample caught in light rain, but it is still considered useful. This code reflects the opinion of the operator that the mesh pair was subject to drizzle for a few, e.g. 2, minutes, or to rain for a brief period of time, e.g. 30 seconds or less. The operator expresses with this comment code his opinion that the rain or drizzle did not effect the amount of sea salt collected on the mesh pair.

2 - sample caught in heavy rain; results are questionable. The operator expresses with this code his opinion that the rain did effect the amount of sea salt collected on the mesh pair.

3 - possible contamination due to insects that were caught on the mesh pair. The operator sees insects or the remnants of insects on the mesh pair at the end of a run. If he is able to remove some or all of this contamination with a pair of cleaned tweezers he will do this, but this comment code will be assigned to the mesh pair anyway.

4 - possible contamination from dust. This code is assigned to the mesh pair if dust or sources of dust are observed by the operator in the vicinity of the sampler location.

5 - other comments or a combination of the coded comments. This comment code will be supplemented with a written footnote below the run.

9 - whitecaps on the bay. This characterizes the state of the surf on Biscayne Bay as determined from observations at stations 1 and 2. This generally corresponds to winds in excess of about 18 km/hr from an easterly direction.

It should be noted that all comment codes, with the exception of 3, are based on the subjective observations and judgement of the operator.

VOLUME - volume of air sampled by the mesh-pair during the run, m^3

NET SODIUM - total sodium as verified by chemical analysis minus average procedural background for the mesh-pair, μg of sodium

TIME - time of day at the start and end of a run (Note: daylight sampling only)

WINDSPEED - average wind speed measured for one minute at the start and end of a run, km/hr

WIND DIR. - direction from which the wind is blowing at the start and end of a run, represented by integers from 1 to 16 corresponding to a 16-point wind rose with 1 as north, 5 as east, 9 as south, and 13 as west

DRY BULB TEMP & DIFF - dry bulb temperature and the difference between the dry bulb and wet bulb temperatures measured at the start and end of a run, °C

EXAMPLE: 31.1 & 3.3/30.0 & 1.7 means:

Dry bulb temperature at start = 31.1°C

Wet bulb temperature at start = 31.1-3.3 = 27.8°C

Dry bulb temperature at end = 30.0°C

Wet bulb temperature at end = 30.0-1.7 = 28.3°C

RELAT HUMID - relative humidity at the start and end of a run, %

COOLING DEVICE CODE -

0 - no cooling device operating

1 - cooling tower operating

2 - spray modules operating

Station numbers as listed in the first column will be numbered 1 through 6 for all runs through January 11, 1974 and 3 through 11 for all runs thereafter because of relocations and the addition of new sampling stations, as mentioned before. This information, as well as weekly sampling frequency, is included in Appendix A, Chronology of Events.

In examining the data in Appendix C it will be noted that sometimes the meteorological data (wind speed, wind direction, dry bulb temperature and depression) are missing at the end of a run for all or some of the stations. The reason was always that the operator expected immediate rainfall and terminated the run. In order to collect the mesh-pair of each station as quickly as possible, the meteorological data collection was omitted. These data are, however, obtainable from FP & L's meteorological data summaries (see Section V).

The remark "Low RPM" indicated that the motor rotation per minute was lower than design (1200 rpm) which, at Turkey Point, was always due to low battery voltage. It implies that the mesh speed, i.e., the impaction speed of the salt particles, is reduced which causes a decrease in the mesh collection efficiency. For a known sea salt particle mass distribution, the change of the collection efficiency can be estimated.

Definitions of column headings and other pertinent data contained in the deposition section (Appendix D) is as follows:

ST # - identification of deposition sampling station locations (concurs with APS location)

DEP - apparent sea salt deposition flux, kg/km^2·month

C - comment code:

0-5 - same as listed already for the APS data except for following additions:

6 - possible contamination due to the presence of a tree frog in the funnel or bottle

7 - contamination from bird excrement in the funnel and bottle

NET SODIUM - total sodium as verified by the chemical analysis minus the average procedural background, μg of sodium

TIME - time of day at the start and end of a run

As mentioned before, deposition samples are left out for a period of 24 hours or longer. The time at the start of the run corresponds to the beginning date listed beside the run number, and the end time corresponds to the date of conclusion of the run. Since these samples are left out for such a long period of time, there is a much greater possibility of sample contamination from rainwater, dust, bugs, etc., than with the APS system.

Both Appendices C and D contain runs with less than the full number of stations. The most common reasons for not operating all the stations were:

1. Impending rain forced premature termination of those sampling stations already set up and prevented the set up of the full sampling system.

2. Sampling equipment was being repaired.

3. The operator had to take care of business related to the sampling program and did not have enough time to set up the entire system.

SECTION VII

DRIFT EMISSION TEST

This chapter describes the drift characterization tests completed on the cooling tower and spray modules during the winter and summer of 1974. The test set-up and procedure are described for each cooling device along with an explanation of the data format and the presentation of some summary data. Moreover, a composite drift mass density distribution for the tower is given, which was calculated along the lines described in Section IV.

Drift emission tests were conducted in two field campaigns. During the winter test, data were acquired on both the cooling tower and the spray modules. During the summer test, however, measurements were made only on the cooling tower. Chronologically, cooling tower drift tests were intended to be conducted first after the ESC crew arrived at Turkey Point on January 21, 1974. It was also planned that an EPA crew would conduct concurrent measurements in the vapor plume by means of a radiosonde suspended from a tethered balloon. After ESC's instrumentation was installed into the cooling tower and the first exploratory tests were initiated, the circulating water pump malfunctioned and had to be disassembled for repairs. Since a delay of about a week was predicted, the cooling tower test, and the EPA vapor plume test, were rescheduled for the last week of February. The instrumentation was then shifted to the barge and spray module drift measurements were conducted until February 19, when the equipment was shifted back to the cooling tower in preparation for the concurrent tests with the EPA field crew. These tests were completed on February 26, and ESC finished the cooling tower test on March 15. For information regarding the results of EPA's vapor plume measurements, contact Bruce Tichenor, Thermal Pollution Branch, National Environmental Research Center, Corvallis, Oregon 97330. The equipment was subsequently again installed into the barge and the spray module test completed on March 21, 1974. The summer test, which consisted only of cooling tower drift measurements, was conducted between July 19 and 24, 1974.

The following main parts of this section describe the cooling tower tests, both winter and summer, and the spray module test.

COOLING TOWER MEASUREMENTS

Measurement Set-Up

For the cooling tower test, measurements were made along the NW-SE and SW-NE diameters in the exit plane of the fan stack. A schematic top view of the tower, illustrating these diameters is shown in Figure 24, Appendix E. The instrument package was mounted on a carriage which could be moved along a beam extending across the exit plane of the tower. The beam was marked at regular intervals of 0.3 m (1 ft.) which facilitated the positioning of the instrument package at any desired point along the 8.36 m diameter of the tower exit plane. In the winter test, the beam was set along the SW-NE diameter first and one drift measurement traverse was made. The beam was then positioned along the NW-SE diameter and a traverse made there. Next the beam was positioned again along the SW-NE diameter for a third traverse and finally, one more traverse was made along the NW-SE diameter. Additional data were acquired for FP&L along the NW radius. These data, which have been made available by FP&L, will be addressed later. During the summer test phase another measurement traverse along the SW-NE diameter was completed. Thus, for this contract, a total of five measurement traverses were made along two perpendicular diameters of the tower, three along the SW-NE diameter and two along the NW-SE diameter.

The instrument package, of which two views are shown in Figures 8 and 9, contained the following instruments:

1. The PILLS II-A System.
2. A Sensitive Paper machine with a stationary sampling head.
3. The hot glass bead IK System.
4. A Gill propeller anemometer.
5. A dry bulb/wet bulb psychrometer.

The sampling volume of the PILLS instrument was the reference point of the instrument carriage during drift measurements. Thus, when the instrument package was to be positioned at a predetermined point along the beam, PILLS' sampling volume, which was 2.33 cubic centimeters

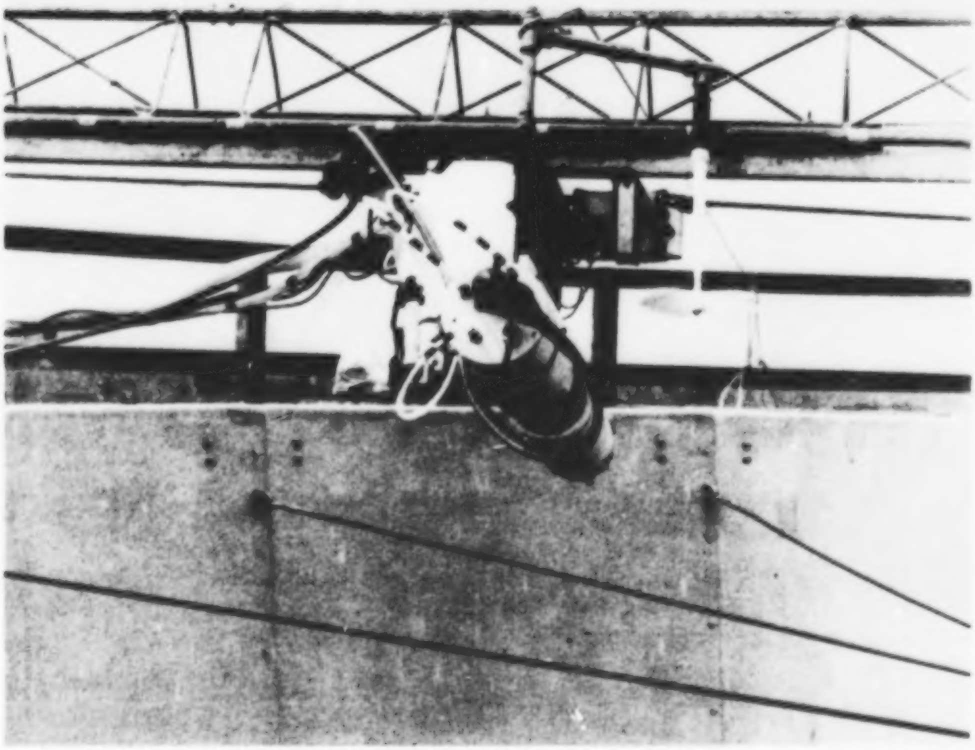


Figure 8. Side view of instrument package during a measurement. The Sensitive Paper Machine is located to the left of PILLS (large white cylindrical object) directly above the rim of the tower wrapped in plastic. Directly to the right of it is an IK tube, then PILLS, and to the right of PILLS are the wet bulb/dry bulb psychrometer and the Gill anemometer. The psychrometer is directly under the cross beam supporting the instruments, and the blade of the anemometer is blurred due to its rotation. The cables coming from the left are the PILLS umbilical cord and purge lines plus the IK pump hose and heater wires and SP control lines.

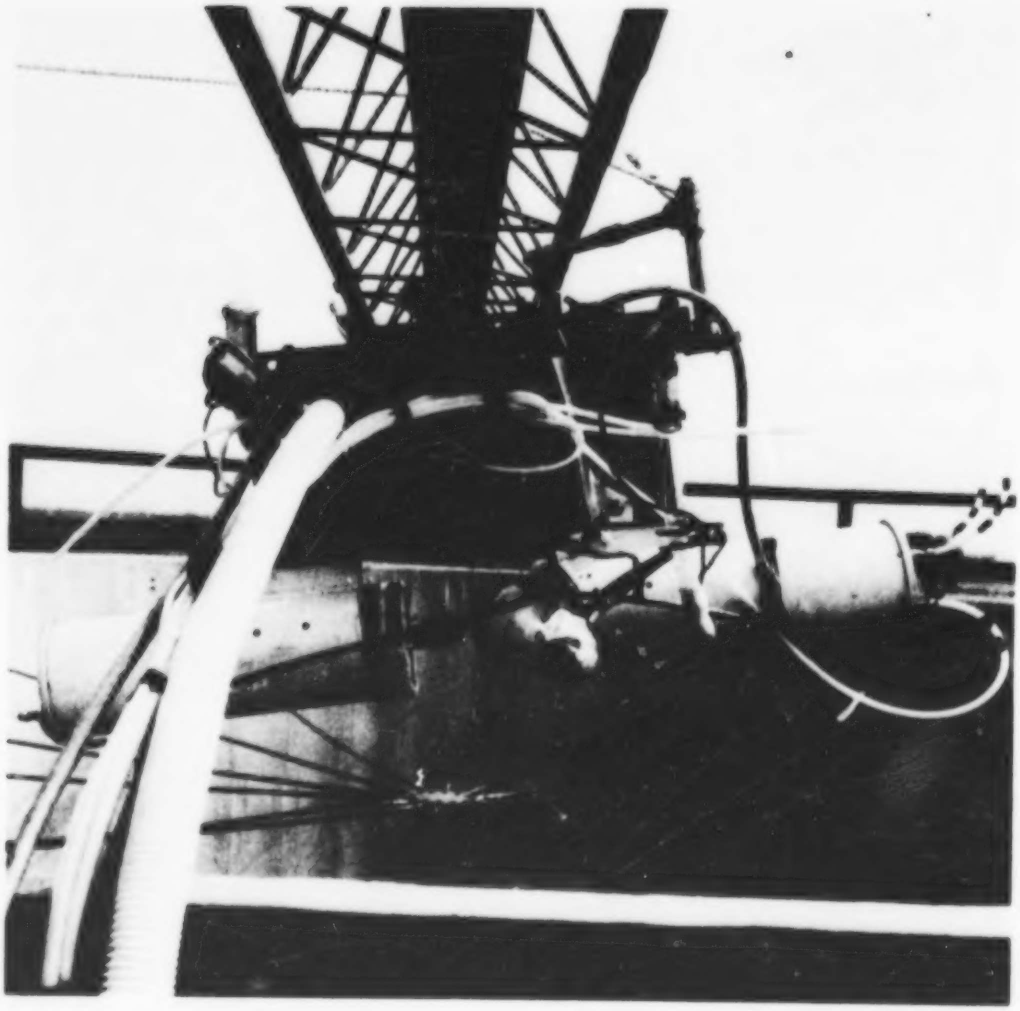


Figure 9. View of the instrument package along the traversing beam. This view of the PILLS, IK and SP instruments shows the PILLS sampling volume in approximately the center of the photograph with the SP machine to the right wrapped in plastic. Further right is an IK tube. The GILL anemometer and psychrometer are hidden by the PILLS mounting plate in this view.

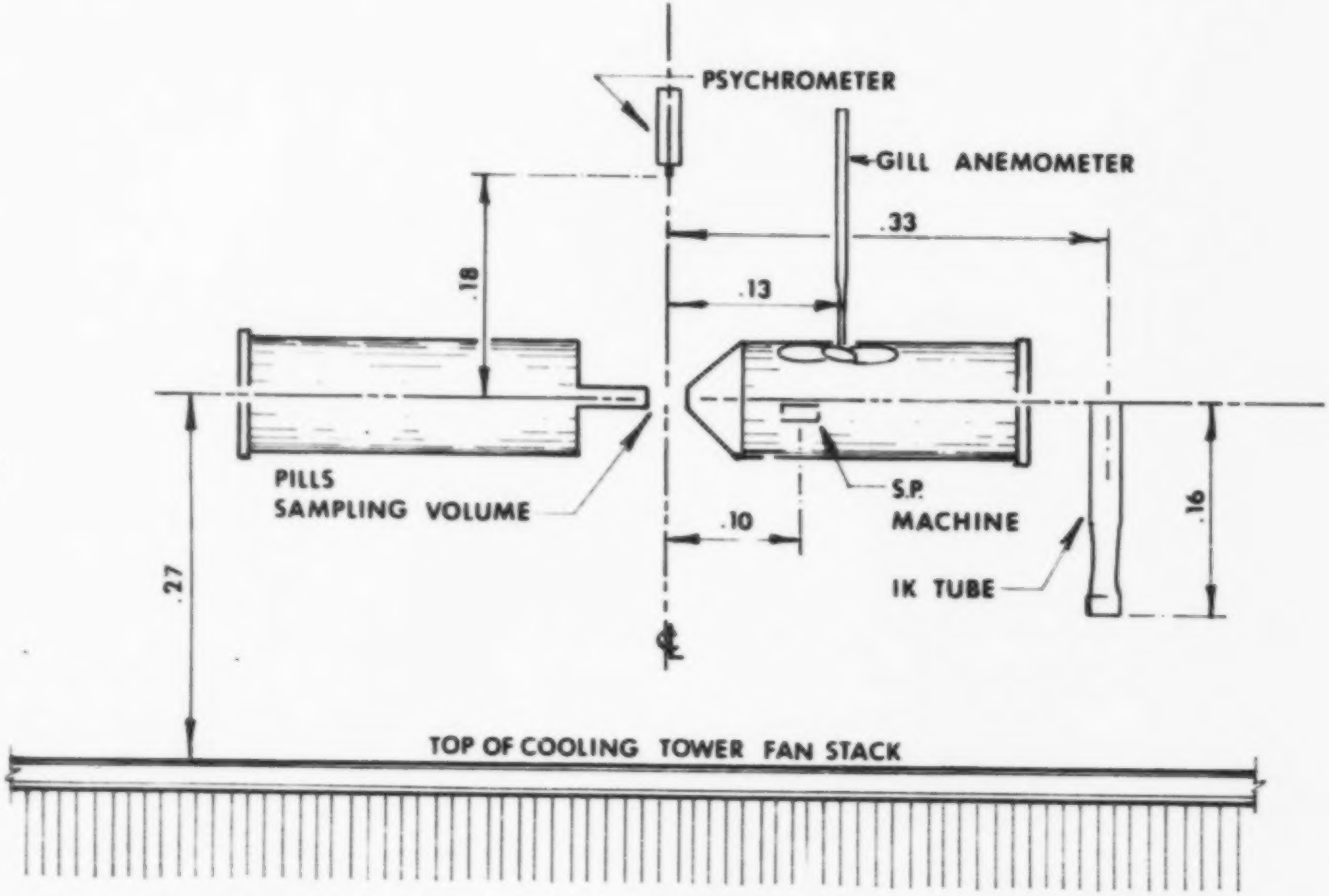


Figure 10. Position of the cooling tower instrumentation relative to PILLS' sampling volume during the winter drift tests. Frontal view along the SW to NE diameter. Instruments are not to scale. Distances in meters.

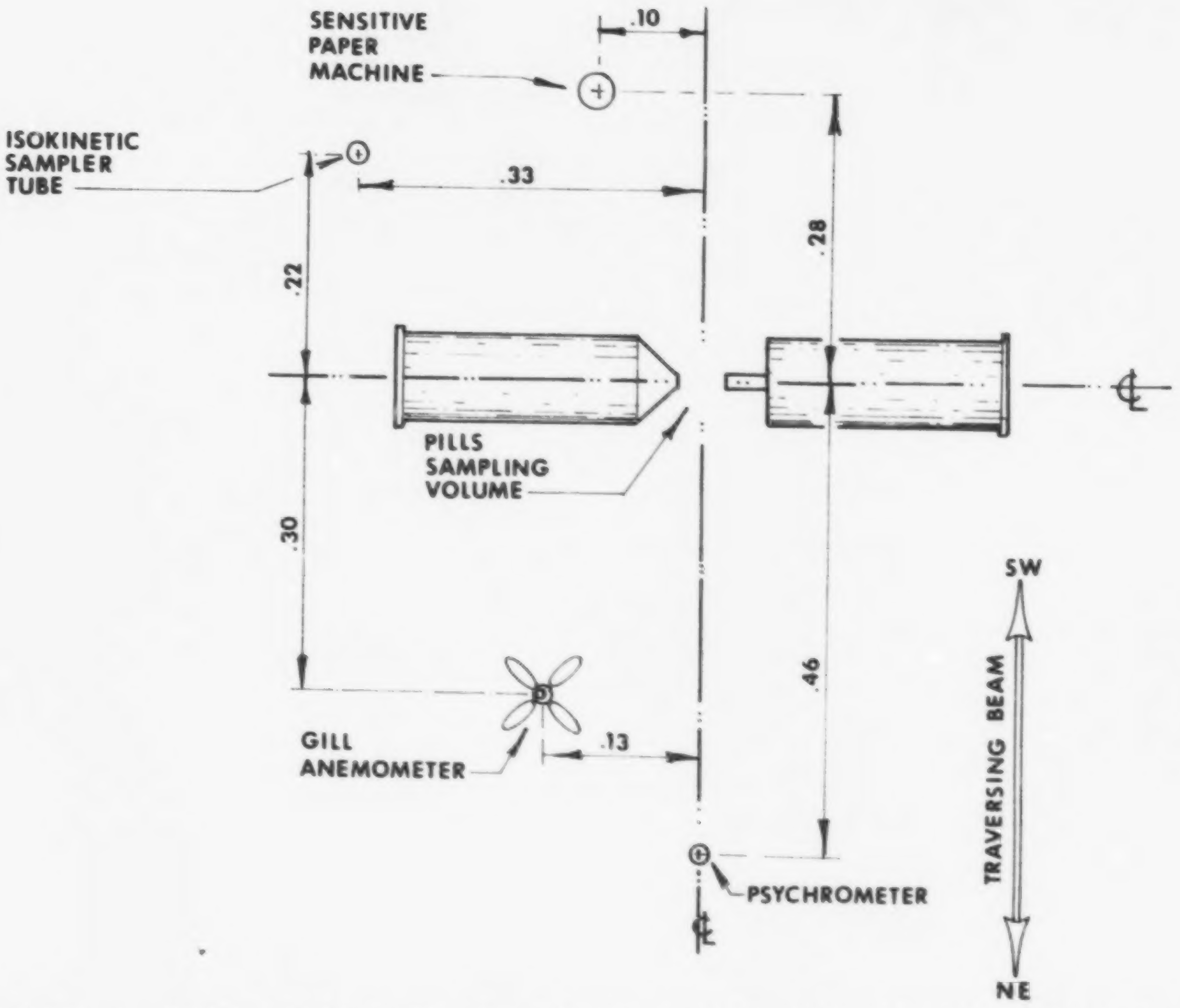


Figure 11. Position of the cooling tower instrumentation relative to PILLS' sampling volume during the winter drift tests. Top view. Instruments are not to scale. Distances in meters.

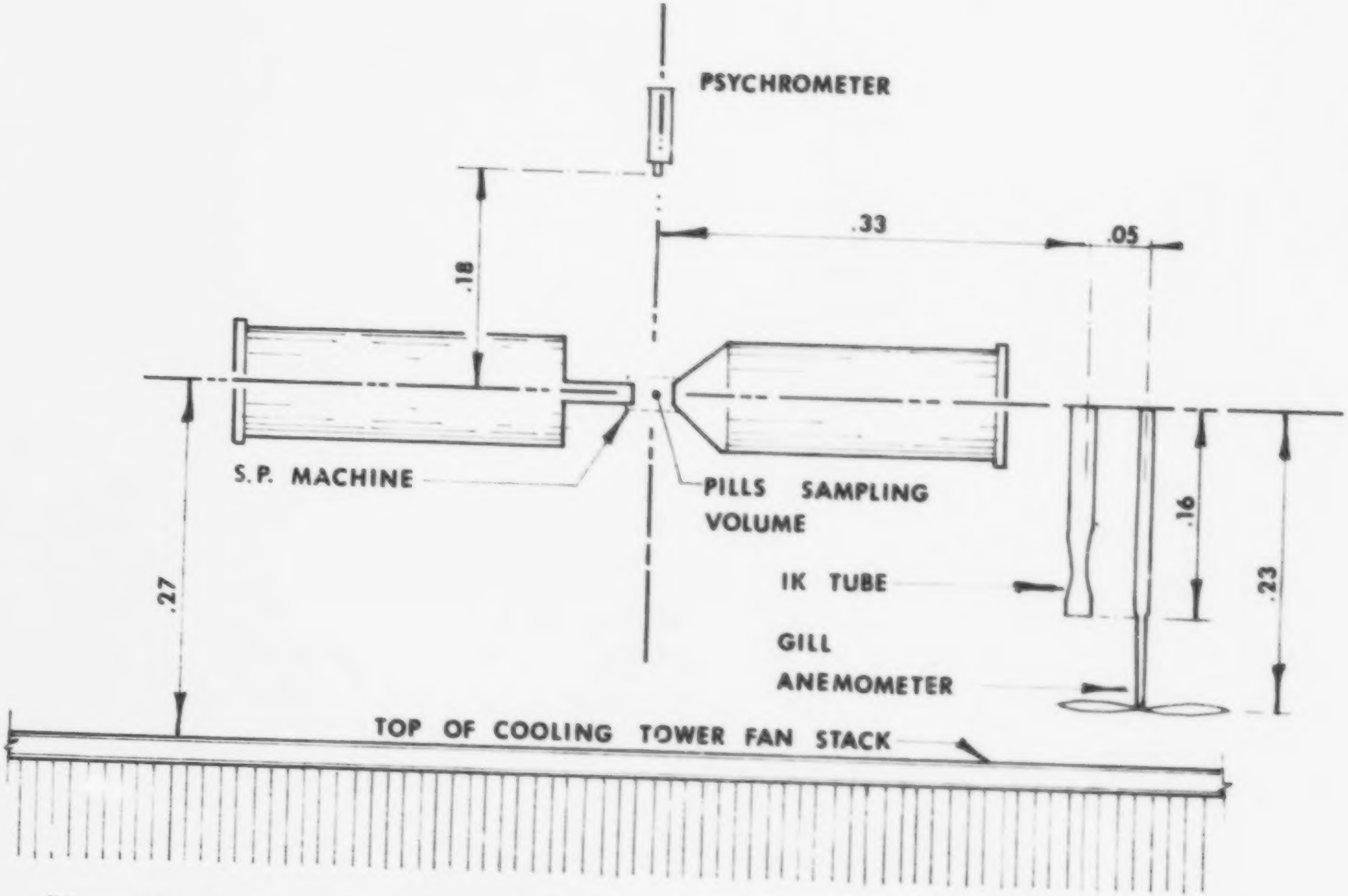


Figure 12. Position of the cooling tower instrumentation relative to PILLS' sampling volume during the summer drift tests. Frontal view along the SW to NE diameter. Instruments are not to scale. Distances in meters.

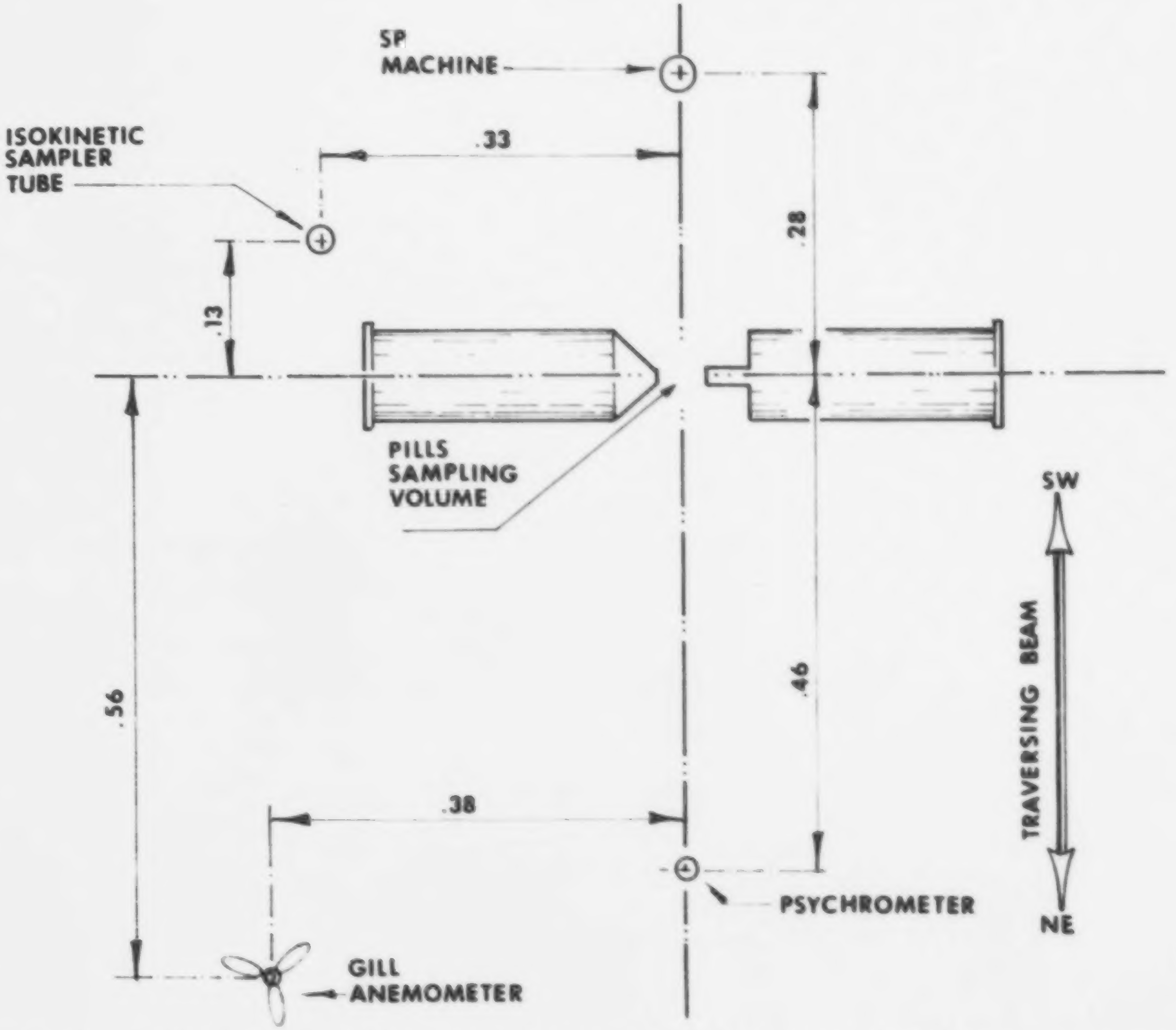


Figure 13. Position of the cooling tower instrumentation relative to PILLS' sampling volume during the summer drift tests. Top view. Instruments are not to scale. Distances in meters.

in size, was lined up with this point. The other instruments were located at known positions with respect to the PILLS sampling volume, as shown by Figures 10-13.

Instrumentation for the winter and summer test was the same with the exception of the GILL anemometer propeller. During the winter test five of the four-blade molded polystyrene propellers failed during air velocity measurements in the tower exit plane, as mentioned previously. Therefore, the four-blade propeller was replaced by a newly developed three-blade propeller which lasted through the summer test.

Measurement Procedure

Before initiating drift measurements along a diameter traverse, an updraft air velocity profile and an air temperature profile were obtained along that diameter traverse. For this purpose, the instrument package was positioned such that the Gill propeller anemometer was lined up with the marked points along the beam. Position 0 was within 10 cm of the fan stack rim while position 1 was 0.3 m (1 ft.) toward the center of the cooling tower exit plane, position 2 was 0.6 m (2 ft.) toward the center and so forth until position 27, which was within about 10 cm of the opposite fan stack rim. A visual estimate of the average updraft velocity and the range of velocity fluctuations at each measurement position was obtained by observing the anemometer's readout meter. The time of observation depended on the range of velocity fluctuations. For fluctuations greater than ±10% the meter was observed for approximately 60 seconds. For fluctuations less than ±10% the meter was observed for approximately 10 seconds. At the same time the air temperature was determined by observations of the psychrometer readout. If a temperature difference with respect to the previous measurement position existed (it was always smaller than 0.8°C), then the readout changed within a few, say 3 or 4 seconds, and was constant thereafter. Short-term fluctuations of the air temperature were not observed, probably due to the psychrometer's response time.

The psychrometer readout displays either the dry-bulb temperature or the wet-bulb depression. Only the dry-bulb temperature was recorded since the wet-bulb depression deviations from zero were usually within the accuracy of the psychrometer (better than 2% RH except at extreme low temperatures and RH).

These resulting updraft velocity and temperature profiles were plotted and are presented in Appendix E. As the anemometer was moved from the tower rim (position 0) towards the center of the diameter, the velocity usually reached a peak, then dropped until around position 7 or 8 where the propeller would stop and reverse direction. For the positions close to the center of the fan stack exit plane, highly fluctuating (> ±100% of average value) and mostly downward velocities were observed. That is, the average component of air velocity was directed down into the tower. Sensitive papers exposed in this region showed only one or two small droplet stains indicating negligible drift effluent in this region. Consequently, the drift measurements were made at those positions where the updraft velocity was positive. As the anemometer was moved through the center region toward the opposite rim, the average updraft velocity would become positive again at positions 18 to 20 and would remain so all the way to the rim.

A drift measurement run was usually begun by exposing a sensitive paper at the measuring point. It should be noted that since PILLS and SP data were not acquired simultaneously, the SP machine was lined up at each measurement position while exposing the paper. The instrument package was then pulled back to the rim of the fan stack, the exposed paper was removed and an unexposed IK tube was attached to the suction hose. Then the instrument package was returned to the measuring point for concurrent and continuous measurements with PILLS and IK. The measurement time was usually between 25 and 60 minutes and was the same for both instruments. At the start of the measurement period, the air flow through the IK tube was adjusted so the the air velocity at the tube opening was equal to the time-mean updraft velocity at that point, as determined by an anemometer measurement which had either been made during the previous run (the distance between the anemometer and PILLS sampling volume was 0.3 m or 1 ft. during the winter test) or from the velocity profile previously taken. At the end of a run, the exposed IK tube was removed and sealed for chemical analysis, the PILLS data were recorded from the pulse height analyzer and, concluding the run, a second sensitive paper was exposed at the measurement position.

For a small fraction of the measurement positions (<10%) both sensitive papers were exposed after the PILLS and IK measurement runs. Unless some difficulty was experienced with the sensitive paper (over-exposure or poor contrast on the paper) which happened less than 10% of the time, only two SP's were exposed at each point.

During the PILLS/IK measurement period the following pertinent cooling tower and ambient data were recorded: Updraft air temperature, hot and cold water temperatures, heads in both hot water distribution basins, wind speed and direction, and ambient air wet and dry bulb temperatures. The basin heads were measured to give an indication of the water flow rate. It was noted during such measurements that the heads were 5 to 7 cm lower during the summer test than they were during the winter test. This indicated a lower water flow rate during the summer test. A visual check was made of valve positions, pump head, and hot water basin floor, including nozzle plugs, along with a check for leaks inside the tower. All were found to be in proper order.

The data from the on-site meteorological tower instruments were recorded continuously on a strip chart recorder throughout each day when drift measurements were in progress, both on the tower and during the spray module tests.

Thus, the raw data obtained at one measuring point consisted typically of:

1. a voltage distribution (from PILLS);
2. two exposed sensitive papers;
3. one exposed IK tube;
4. updraft air velocity data;
5. temperature data of the updraft air;
6. hot and cold water temperatures;
7. hot water distribution basin heads; and
8. meteorological data (wind speed and direction, ambient wet bulb and dry bulb temperatures).

Also, usually once during a day of drift data acquisition, a water sample was taken from one of the hot water distribution basins for analysis of its sodium and magnesium concentration.

A note is necessary with respect to the tower hot and cold water temperatures. All hot water temperatures were measured with a mercury thermometer in the north hot water distribution basin. The cold water temperature was obtained by means of a thermometer which was installed into the discharge pipe prior to ESC's winter test. During the winter test this thermometer was calibrated by ESC three times. It was found that it read at least 1.67°C (3°F) too low. Therefore, 1.67°C was added to all discharge temperatures obtained with this thermometer during the winter test. During the summer test recalibration of this thermometer indicated that it read at least 2.8 to 3.3°C too low. It was furthermore later determined that the temperature sensor had been dislodged from its original position and drifted down the discharge pipe as far as the attached cable permitted. For these reasons, the outlet temperature measurements are considered unreliable and are not recorded on the summer test data sheets.

To insure consistency in the resultant data from PILLS and SP, certain measures were taken for quality control. As mentioned previously, the monodisperse water droplet generator was taken to the field for calibration checks on the PILLS instrument. Moreover, the PILLS instrument was calibrated before both the winter and summer test phases. The timer on the SP machine was checked from time to time against a stop watch to insure correct exposure of the sensitive papers. Also, a sample of an SP from each batch was tested for good contrast properties before that batch was used for data acquisition. Together, these steps helped to guarantee uniformity in the field data quality.

Drift Measurements for Florida Power & Light Company

On February 27, 1974, during the winter test phase of the cooling tower test, drift data were acquired by ESC for Florida Power & Light Company along one-half of the NW-SE diameter. A copy of the complete test report is included in Appendix F. ESC and EPA wish to express their appreciation to Florida Power & Light Company for allowing these data to be included in this report.

Measurement techniques employed during the FP&L test as well as the types of data taken were the same as described above. However, the IK data measured for FP&L are presented in terms of apparent drift parameters. These are drift water parameters which are calculated from drift mineral residue parameters with the assumption that the mineral concentration of the drift droplets equals that of the circulating cooling water. The same assumption was already used in Equation (37). Starting, for example, with the sodium mass concentration, $\phi_{Na\ j}$, which is defined by Equation (22), the apparent drift mass concentration, $\chi'_{Na\ j}$, can be calculated as follows:

$$\chi'_{Na\ j} = \frac{\phi_{Na\ j}}{C_{Na}/s_{cw}} \quad (gm/m^3) \qquad (45)$$

where C_{Na} with dimensions of mass per volume is the sodium concentration in the circulating water during the period of time $\phi_{Na\ j}$ was measured and s_{cw} is the density of the cooling water which is again approximated by $s_{cw} = 1.0$ gm/cm^3.

Ideally, the apparent drift mass concentration, $\chi'_{Na\,j}$, should depend only on the measurement position, but not on the element used to calculate it; that is, using another element should yield the same numerical value for the apparent drift mass concentration. In practice this is usually not the case. The average discrepancy between the apparent drift mass concentrations calculated from sodium and magnesium analyses was only 6% for all Turkey Point IK data. In earlier programs, however, larger average values have been observed. The underlying reasons for this discrepancy are not known. It has been suggested[24] that it may be due to different retentions of various elements in the heated IK tube, or possibly to the enrichment or derichment[25] of constituents of the drift droplets themselves during their formation in the fill. Whatever the reason the subscript "Na" was consequently retained on the left hand side of Equation (45).

It should be noted that the apparent drift mass fraction which is defined as the apparent drift mass emission in percent of the cooling water mass flow rate, is identical to the mineral mass emission fraction, η_k:

$$\text{Apparent drift mass fraction} = \frac{\sum\limits_j \dfrac{\Delta m_{kj}}{C_k/s_{cw}}}{R} \times 100\% \qquad (46)$$

If s_{cw} and R are again considered constant, then:

$$\text{Apparent drift mass fraction} = \frac{s_{cw} \sum\limits_j \Delta m_{kj}/C_k}{R} \times 100\% \qquad (47)$$

The right hand side of this equation is equal to the right hand side of Equation (33). Thus the apparent drift mass fraction which is denoted by Δ in ESC's report to FP&L can be directly compared to the mineral mass emission fractions presented in this report.

Data Format

The data resulting from the cooling tower measurements are presented in Appendix E. The data are grouped according to each of the five measurement diameters (SW-NE 1, 2, 3, and NW-SE 1, 2).

Within each diameter are presented updraft air velocity and temperature profile sheets, PILLS/SP droplet size spectra sheets, an isokinetic sampling data sheet and an isokinetic data extension sheet. A summary sheet of droplet mass for droplets over 600 μm in diameter for the five diameters is included at the end of Appendix E. A description of each of these data sheets with its nomenclature follows here.

The first type of data sheet presented gives updraft air velocity and temperature profiles for the diameter. These take the form of a graph and as such are essentially self-explanatory. Air updraft velocities taken from velocity profiles are plotted along with visual estimates of the velocity fluctuation. Points are also plotted for the velocities which were recorded during drift measurement runs. These velocity profiles are given in Figures 25 through 30 in Appendix E. Two velocity traverses are also shown for the SW-NE diameter where the output of the Gill anemometer was fed into the PHA for a percent time vs. velocity distribution for approximately 30 seconds at each position. These data are presented in Tables 6 and 7, Appendix E. They show a time distribution of updraft air velocity and were taken in order to determine the range of fluctuation of the air velocity over a relatively short period of time (30 sec.).

Although this technique yields more accurate data with regard to the updraft air velocity than the technique described earlier, the visual observation of the anemometer readout was more useful for quickly identifying the average updraft air velocity at a point and therefore was used throughout the test.

It should be noted that the T_{wet}/T_{dry} and wind speed data written on the velocity and temperature profile graphs pertain to ambient meteorological conditions when the profiles were taken.

The second type of data sheet is that which presents droplet distribution data from the PILLS and SP systems. Each sheet identifies the diameter, whether it was the first, second or third traverse along that diameter, position, date, and time frame of the measurement. Reference is made on each sheet to the position where an IK tube was exposed during the same time frame. Each PILLS/SP data sheet corresponds to one position on a tower diameter.

The tabular data is arranged according to droplet size range. Each droplet size range, I, is defined by the lower diameter, D(LOW); the upper diameter, D(HI); the difference in these diameters, DEL D; and the center diameter of the range, D(CEN).

For each droplet size range, the value of P(D), the particle density distribution, is given. The formulation of this data from PILLS and SP raw data was described in detail in Section IV. The tabulated values of P(D) are taken from the consolidated PILLS/SP curves. In the next column to the right, the mass density distribution data, DEL X/DEL D, is tabulated. These values were calculated using Equation (2) in Section IV. Next is listed the drift mass concentration (drift mass per unit volume of air) in each size range, DEL X, which was calculated from Equation (3) in Section IV. The drift mass flux, DEL FLUX, is listed next. These values were calculated using Equation (5a) in Section IV. The droplet velocities are listed in the last column. They were calculated by subtracting the settling velocity of a droplet with diameter D(CEN) from the time-mean air updraft velocity measured at this position.

The total drift mass per unit volume of air, X, which is the summation of the individual DEL X values, is presented directly below the tabulation. Likewise the value of DRIFT FLUX is found from a summation of the DEL FLUX values. By multiplying the flux by a half annulus area, ΔA, associated with the position, the total emitted drift mass associated with that position is found. Also given is the mass median diameter calculated from the drift mass concentration data, DEL X.

Tower operational conditions during the time of the measurement are also presented on each data sheet. The time-mean air updraft velocity at the measurement position is represented by $\bar{V}_u$; T_a is the temperature of the air leaving the fan stack; T_i is the hot water temperature; and T_o is the cold water temperature. For the winter test, range, approach and approximate heat load were calculated, the latter by using the manufacturers' specified water flow rate of 1,260 kg/sec (20,000 gpm). Last are presented ambient conditions during the time of the test: wind speed, wind direction and wet bulb/dry bulb temperature.

In the PILLS/SP data section of this report, the tabular data for the droplet density distribution are typically terminated at droplet diameters of 600 μm and sometimes below. Because of the nature of the PILLS instrument response characteristics it is necessary for the field data to have good statistical quality before an accurate particle density distribution curve, p(d), can be derived. Consequently, although PILLS is sensitive to droplets up to 1,000 μm in diameter, the accuracy of measurement to that limit depends heavily on the droplet count which is often sparse in the large diameter ranges. In the time interval typical for a measurement at Turkey Point, the generated droplet statistics were adequate for definition of a p(d) only up to 600 μm. However, droplets above that size range up to 2,240 μm were observed on sensitive papers but only singly and with no statistical basis to formulate a p(d). Since the possibility existed that these droplets might contain a significant amount of drift mass, e.g. more than 20% of the drift mass contained in droplets smaller than 600 μm, their drift mass flux was calculated and the results are included in the third type of data sheet, Table 8 in Appendix E. On this sheet the diameter traverses and positions are shown where droplets larger than 600 μm in diameter were measured by the SP system. Since only a few positions from each diameter showed this type of data, the results from all 5 diameters are included on one sheet. Also tabulated is the percentage of drift flux these droplets represent over the flux already shown up to 600 μm on the regular PILLS/SP data sheets.

The isokinetically obtained drift mineral residue data are tabulated in the fourth type of drift data sheet. Each sheet contains the IK data for the measurements made along an entire diameter. The results of the IK measurements and data reduction are arranged in rows corresponding to each measurement point. The position along the diameter traverse and the data of measurement are given at the left side of each sheet. Reading from left to right, then, follow M_{Na} and M_{Mg}, the masses of sodium and magnesium collected by the IK tube. Next is given V_s, the volume of air sampled by that tube and $\bar{v}_u$, the time-mean air updraft velocity measured at that point.

As mentioned previously, the concentration of sodium and magnesium in the cooling water fluctuated from day to day during the test period. The concentration values for sodium, C_{Na}, and magnesium, C_{Mg}, which were found by taking a sample of the cooling water and chemically analyzing it, are listed in Table I along with the averages of these values, $\bar{C}_{Na}$ and $\bar{C}_{Mg}$. These average values of the sodium and magnesium concentrations were selected as reference concentrations, $C_{Na\ Ref} = \bar{C}_{Na}$ and $C_{Mg\ Ref} = \bar{C}_{Mg}$, to which all mineral mass flux data were adjusted as outlined in Section IV. The adjusted sodium and magnesium mass fluxes were calculated for each position according to

$$F^a_{Na} = \frac{M_{Na} \cdot \bar{v}_u}{V_s} \cdot \frac{\bar{C}_{Na}}{C_{Na}} \quad (\mu g/m^2 \cdot s) \qquad (48)$$

$$F^a_{Mg} = \frac{M_{Mg} \cdot \bar{v}_u}{V_s} \cdot \frac{\bar{C}_{Mg}}{C_{Mg}} \quad (\mu g/m^2 \cdot s) \qquad (49)$$

Table 1

SODIUM AND MAGNESIUM CONCENTRATIONS OF THE COOLING WATER

Date	C_{Na} (mg/l)	C_{Mg} (mg/l)
1/28/74	8,975	975
1/31/74	8,900	982
2/01/74	9,025	995
2/13/74	7,375	848
2/14/74	9,500	1,050
2/15/74	8,638	987
2/23/74	7,800	903
2/25/74	6,875	783
2/26/74	7,500	848
2/27/74	6,625	748
2/28/74	7,675	818
3/08/74	11,875	1,180
3/09/74	10,875	1,160
3/11/74	11,575	1,180
3/12/74	11,375	1,140
3/13/74	11,875	1,160
3/14/74	11,125	1,160
3/15/74	11,875	1,200
3/31/74	11,575	1,260
7/20/74	11,000	1,200
7/22/74	10,550	1,210
7/23/74	11,200	1,240
7/24/74	9,850	1,220

AVERAGE SODIUM CONCENTRATION, $\bar{C}_{Na}$ = 9,723 mg/l

AVERAGE MAGNESIUM CONCENTRATION, $\bar{C}_{Mg}$ = 1,054 mg/l

These equations follow from (20), (21) and (29) if the average sodium and magnesium background values of the IK tubes, $M_{B\ Na}$ and $M_{B\ Mg}$, are neglected. Chemical analyses of unexposed IK tubes selected at random as a data quality control measure yielded in the average $M_{B\ Na} = 6\ \mu g$ and $M_{B\ Mg} < 1\ \mu g$. The chemical analysis of the exposed IK tubes showed that all but two IK tubes contained more than 1000 μg of sodium and more than 100 μg of magnesium. The two remaining tubes contained each more than 500 μg of sodium and more than 50 μg of magnesium. The background values were therefore neglected.

The adjusted mineral mass emissions for sodium and magnesium, Δm^a_{Na} and Δm^a_{Mg}, were calculated by multiplying the flux by ΔA, the section of the fan stack exit area associated with the measurement position. The total adjusted sodium and magnesium mass emissions, m^a_{Na} and M^a_{Mg}, were found by summing over all values of Δm^a_{Na} and Δm^a_{Mg}, respectively.

Beneath the tabular data, the mineral mass emission fractions, η_{Na} and η_{Mg}, are listed which were calculated according to

$$\eta_{Na} = \frac{m^a_{Na} \cdot s_{cw}}{R \cdot \bar{C}_{Na}} \times 100\% \tag{50}$$

$$\eta_{Mg} = \frac{m^a_{Mg} \cdot s_{cw}}{R \cdot \bar{C}_{Mg}} \times 100\% \tag{51}$$

Again, $s_{cw} = 1\ gm/cm^3$ and $R = 1260$ kg/s during the winter test and $R = 970$ kg/s during the summer test. Finally the average value of the mineral mass emission fraction, η, is given.

If the mineral mass emission data obtained during the winter and summer tests are compared, the differences in the water flow rates should be kept in mind since the data are not adjusted to a common water flow rate. However, the mineral mass emission *fractions* are directly comparable.

A potential error source in the IK measurements is the sodium component of sea salt that is contained in the ambient air. When the air passes through the cooling tower fill an unknown fraction of the sea salt particles is scrubbed out by the cooling water. Thus the air that is sampled by the IK tubes contains, besides drift droplets, sea salt particles at a concentration that is smaller than the ambient sea salt concentration. In order to arrive at a conservative estimate of the mass of sodium that may be attributable to ambient sea salt, calculations are presented which are based on the following assumptions:

1. No scrubbing of sea salt particles takes place in the cooling tower fill.
2. The IK tubes collect sea salt particles with 100% collection efficiency.
3. 30.6% of the sea salt is sodium.

With these assumptions, the following equation expresses the collected mass of sodium, M_{ANa}, attributable to ambient sea salt in percent of the total mass of sodium stripped from the IK tube:

$$M_{ANa} = \frac{\phi \cdot 0.306 \cdot V_S}{M_{Na}} \times 100\% \qquad (52)$$

where ϕ is the ambient sea salt concentration as determined by the Airborne Particle Sampler and tabulated in Appendix C, V_S is the volume of air sampled by an IK tube, and M_{Na} is the mass of sodium stripped from an IK tube. V_S and M_{Na} are listed in the isokinetic sampling summaries that are part of Appendix E.

For the cooling tower test, M_{ANa} was calculated for several IK tubes:

1. IK tube exposed at position 23.3 of diameter SW-NE 2 on 3/12/74:

   $V_S = 38.64\ m^3$

   This IK tube sampled the largest air volume of all tubes exposed during the cooling tower test.

   $M_{Na} = 24{,}739\ \mu g$

   $\phi = 3\ \mu g/m^3$ at station 3 (Run #108)

   $M_{ANa} = 0.14\%$

2. IK tube exposed at position 1.33 of diameter SW-NE 1 on 2/23/74:

V_S = 28.71 m^3

M_{Na} = 2868 μg

ϕ = 11.76 $\mu g/m^3$ at station 3 (Run #99)

ϕ was one of the highest ambient values that occurred during the cooling tower test

M_{ANa} = 3.6%

3. IK tube exposed at Position 22.3 of diameter NW-SE 2 on 3/15/74:

V_S = 16.2 m^3

M_{Na} = 2864 μg

ϕ = 10.65 $\mu g/m^3$ at station 3 (Run #111)

ϕ was one of the highest ambient values that occurred during the cooling tower test

M_{ANa} = 1.8%

4. IK tube exposed at position 0.6 of diameter SW-NE 3 on 7/20/74:

V_S = 9.3 m^3

M_{Na} = 554 μg

This IK tube collected the lowest amount of sodium during the cooling tower test

ϕ = 3.8 $\mu g/m^3$ at station 3 (Run #206)

M_{ANa} = 2%

It should be noted that these IK tubes were selected such that in Equation (52) either one of the two parameters in the numerator was the largest, or the parameter in the denominator was the smallest that was experienced during the cooling tower test. Although a combination of all three parameters may exist that would yield a larger value of M_{ANa} than the largest calculated above, the above values give an idea of the magnitude of M_{ANa}.

For the IK tubes exposed during the spray module test M_{ANa} can be calculated in the same manner. The fact that the first assumption of the three listed above is inapplicable is of no consequence. Thus for the spray module test M_{ANa} was calculated for the following IK tubes:

5. IK tube exposed at position 33.5/270/4.6 on 2/15/74 at 1359 hours:

   V_s = 17.82 m^3

   This IK tube sampled the largest air volume of all tubes exposed during the spray module test.

   M_{Na} = 5740 μg

   ϕ = 5.3 $\mu g/m^3$ at station 3 (Run #93)

   M_{ANa} = 0.5%

6. IK tube exposed at position 73.2/280/7.6 on 3/27/74 at 1801 hours:

   V_s = 2.73 m^3

   M_{Na} = 138 μg

   This IK tube collected the smallest amount of sodium of all tubes exposed during the spray module test.

   ϕ = 5.9 $\mu g/m^3$ at station 3 (Run #118)

   M_{ANa} = 3.6%

7. IK tube exposed at position 36.6/290/9.1 on 3/26/74 at 1352 hours:

   V_s = 5.86 m^3

   M_{Na} = 439 μg

   ϕ = 8.0 $\mu g/m^3$ at station 3 (Run #117)

ϕ was the highest ambient value that occurred during the spray module test.

$M_{ANa} = 3.3\%$

These values are very similar to those obtained for the cooling tower test, and, as mentioned before, there may be a combination of parameters that yield a larger value for M_{ANa} than the largest calculated above.

In summary, the amount of sodium that may be attributable to ambient sea salt which is collected by the IK tubes during the drift tests at Turkey Point is of the order of 3% of the total collected mass of sodium and therefore considered negligible.

Due to the fact that the sodium and magnesium mass emission fractions agree well, it is tempting to infer that M_{AMg} is likewise of the order of 3% of the total collected mass of magnesium.

During the winter test no isokinetic sampling tubes were exposed at the edges of the region of the tower with high updraft velocity. In earlier drift tests on mechanical draft towers, the rate of mass emission decreased quite rapidly at positions such as this since both the mineral mass concentration and the updraft velocity decrease as the edges of this region are approached. During this measurement program, however, the mineral mass concentration had relatively high values at the edge of the measurement region for each of the radial traverses. It therefore became clear during the data reduction that more IK data points during this phase would have been useful. Consequently, during the summer test, IK data were taken at more points along the diameter; sixteen points versus ten to twelve points in the winter test.

In order to calculate an upper limit of the mineral mass emission fraction for the winter diameters, the adjusted mineral mass emission rates were calculated for those positions on the tower where the updraft velocity was positive, but where no IK tube had been exposed. For these positions it was assumed that the adjusted mineral mass concentration, ϕ^a_{kj}, has the same value as at the nearest position at which a measurement had been made. This assumption was made only in order to arrive at an upper limit of the mineral mass emission fraction. This data extension may best be demonstrated by an example. The isokinetic sampling summary for diameter SW-NE 1 shows that IK data were obtained for positions 0.3 through 5.3. In order to obtain a sodium mass emission estimate for position 6.3 it is assumed that the adjusted sodium mass concentration at position 6.3 equals that of position 5.3:

$$\phi^a_{Na\ 6.3} = \phi^a_{Na\ 5.3} \tag{53}$$

$\phi^a_{Na\ 5.3}$ is obtained from the adjusted sodium mass flux, $F^a_{Na\ 5.3}$ according to:

$$\phi^a_{Na\ 5.3} = F^a_{Na\ 5.3} / \bar{v}_{u\ 5.3} = 2256 / 10.9 = 207 \frac{\mu g}{m^3} \tag{54}$$

The sodium mass flux at position 6.3 is then

$$F^a_{Na\ 6.3} = \phi^a_{Na\ 6.3} \cdot \bar{v}_{u\ 6.3} = 207 \cdot 8 = 1656 \frac{\mu g}{m^2 s} \tag{55}$$

The area associated with position 6.3 is $\Delta A_{6.3} = 2.16\ m^2$ and the adjusted sodium mass emission through this area is

$$\Delta m^a_{Na\ 6.3} = F^a_{Na\ 6.3} \cdot \Delta A_{6.3} = 1656 \cdot 2.16 = 3577 \frac{\mu g}{s} \tag{56}$$

These extended sodium emission parameters can be found on the Turkey Point Isokinetic Data Extension for Diameter SW-NE 1 together with the extended magnesium emission parameters. Isokinetic data extensions were calculated for all diameter traverses obtained during the winter test, that is, SW-NE 1, SW-NE 2, NW-SE 1, NW-SE 2.

Drift Data Summary for the Cooling Tower

The drift water emission rates of the cooling tower as determined by PILLS/SP are listed in Table 2. Likewise the sodium and magnesium mass emissions rates, as determined by IK, are tabulated in Table 3. The adjusted sodium mass flux for each position of all five diameters is given in Table 4. The values for the four diameters traversed during the winter test were averaged, and the averaged values are listed in Table 4, and are also plotted in Figure 14. If data at a position were not taken for all four diameters, only the available data was averaged. It should be noted that these four measurement traverses were made along two perpendicular directions, hence the average values should not be associated with only one diameter; rather with a sector which includes the two perpendicular radii. Moreover, the measurement positions for each diameter do not fall exactly at the same distance from the fan stack rim. Data summarized

Table 2

RATE OF DRIFT WATER EMISSION FROM THE COOLING TOWER
(From PILLS/SP Measurements)

Diameter	Test Phase	Drift (μg/s)	Drift (lb/hr)
SW-NE 1	Winter	2,296,000	18.22
SW-NE 2	Winter	5,484,000	43.52
SW-NE 3	Summer	6,602,000	52.40
NW-SE 1	Winter	1,309,000	10.39
NW-SE 2	Winter	1,412,000	11.21

Table 3

ADJUSTED TOTAL MINERAL EMISSION RATES FROM THE COOLING TOWER
(From IK Measurements)

Diameter	Test Phase	Measured $m^{a}\text{Na}$ (μg/s)	Extension $m^{a}\text{Na}$ (μg/s)	Measured $m^{a}\text{Mg}$ (μg/s)	Extension $m^{a}\text{Mg}$ (μg/s)	Total $m^{a}\text{Na}$ (μg/s)	Total $m^{a}\text{Mg}$ (μg/s)	Total $m^{a}\text{Na}$ (lb/hr)	Total $m^{a}\text{Mg}$ (lb/hr)
SW-NE 1	Winter	62,436	25,730	6,786	2,818	88,166	9,604	0.70	0.076
SW-NE 2	Winter	103,791	18,342	10,977	2,021	122,133	12,998	0.97	0.10
SW-NE 3	Summer	111,704	-	11,989	-	111,704	11,989	0.89	0.095
NW-SE 1	Winter	59,829	14,385	6,893	1,644	74,214	8,537	0.59	0.068
NW-SE 2	Winter	60,063	15,402	6,679	1,747	75,465	8,426	0.60	0.067

Note: These values for mineral mass emission rates have been adjusted to a reference value for the mineral concentration in the basin water.

Table 4

ADJUSTED SODIUM MASS FLUX DATA SUMMARY

($\mu g/m^2 \cdot s$)

POS	Winter Test SW-NE 1	Winter Test SW-NE 2	Winter Test NW-SE 1	Winter Test NW-SE 2	Average of 4 Winter Diameters	Summer Test SW-NE 3	Average of All 5 Diameters
0	1,095	715	620	599	757	461	698
1	1,211	1,242	860	1,620	1,233	621	1,111
2	1,445	829	1,841	1,842	1,489	970	1,385
3	2,568	1,152	2,223	2,832	2,194	1,207	1,997
4	2,440	1,160	1,764	3,808	2,293	2,305	2,295
5	2,256	962	1,286	1,623	1,532	1,227	1,470
6						887	887
7						277	277
19						1,207	1,207
20		2,163		973	1,568	3,027	2,054
21		3,078	1,639	1,143	1,953	3,220	2,270
22	2,073	5,183	2,469	1,290	2,754	6,056	3,414
23	2,621	7,673	2,469	1,370	3,533	2,222	3,271
24	3,191	7,632	2,669	2,515	4,002	1,526	3,507
25	2,118	3,568	2,271	1,118	2,269	6,142	3,043
26						5,236	5,236

Note: Water flow rate for the winter test was 1,260 kg/s (20,000 gpm)
Water flow rate for the summer test was 970 kg/s (15,400 gpm)

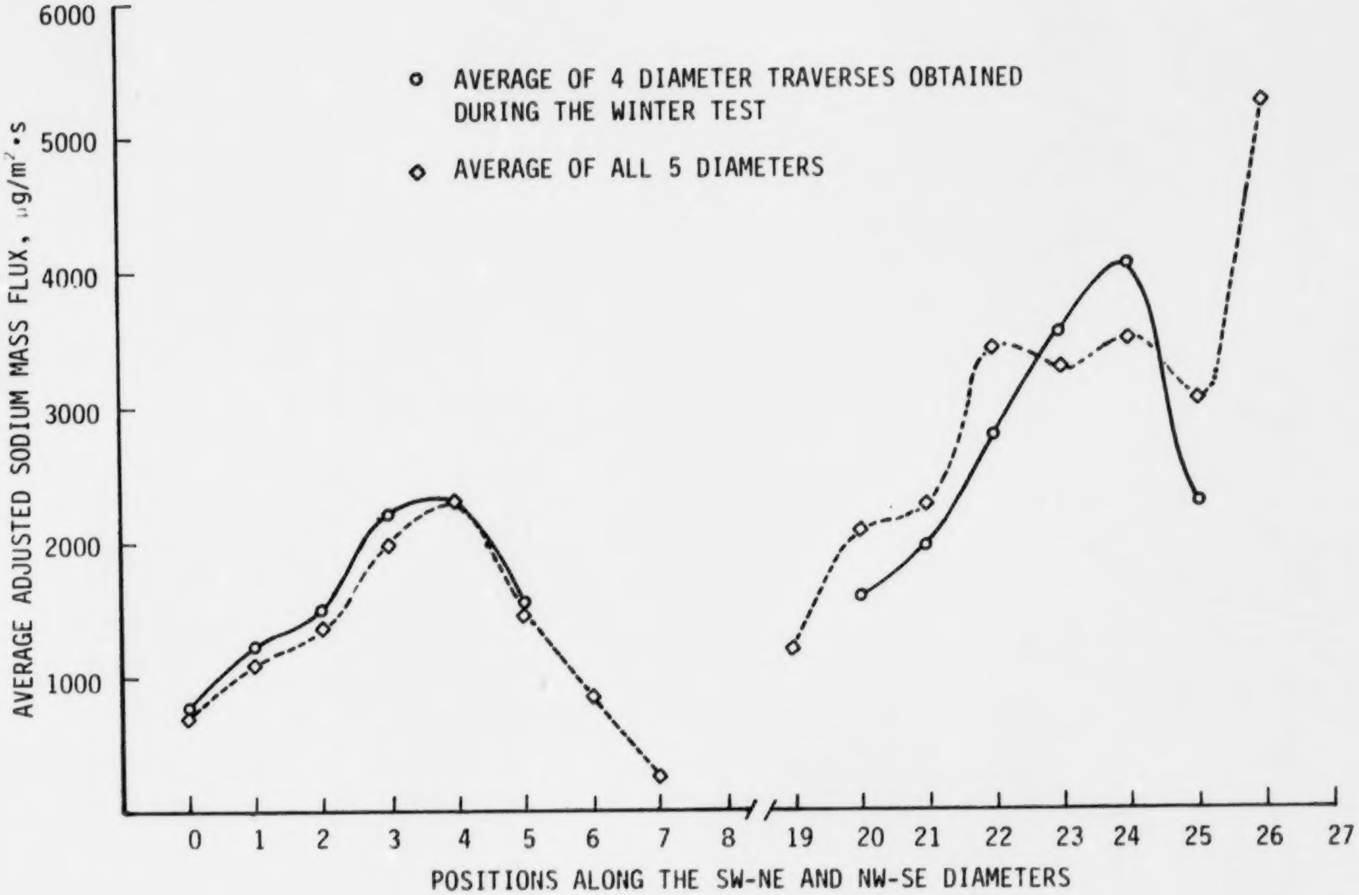


Figure 14. Comparison of IK average adjusted sodium mass flux vs. position.

in this manner are mainly useful for the purpose of illustration. Also shown in Table 4 and in Figure 14 are the averages of all five diameter traverses. Comparing the two curves in Figure 14, one can see that the effect of including the summer data in the average is small on only one radius, tending to decrease the sodium mass flux at each position approximately equally. On the other radius the effect is quite noticeable and erratic. The high value at position 26 was due to the one data point taken during the summer test since no IK measurements were taken at this position during the winter test.

The calculated values for the upper limit of the mineral mass emission fraction for each of the five diameters is shown below, as obtained from the IK data sheets:

Diameter Traverse	Upper Limit of the Mineral Mass Emission Fraction η_{max}, (%)
SW-NE 1	0.00072
SW-NE 2	0.00099
SW-NE 3	0.0012
NW-SE 1	0.00062
NW-SE 2	0.00063

The arithmetic average of these values is 0.00083%. It should be noted that the water flow rate during the winter test was 1260 kg/s (20,000 gpm) whereas it was only 970 kg (15,400 gpm) during the summer test when data along the diameter traverse SW-NE 3 were obtained.

Cooling Tower Composite Curve Calculation

The drift droplet size data obtained by PILLS/SP during the five diameter traverses of the cooling tower was used to calculate a cooling tower composite curve in the manner described in Section IV. The values calculated for composite drift mass emission, ΔD_i composite, and composite drift mass density distribution $\left.\frac{\Delta X_i}{\Delta d}\right|_{\text{composite}}$, are tabulated in Table 5. The composite mass emission data for each size range were summed yielding a total composite drift mass emission rate, $D_{\text{composite}}$, of 3.42 gm/s. The composite tower drift fraction at design flow of 1260 kg/s is, therefore, 0.00027%. The composite mass median diameter calculated from the drift mass density distribution equals 120 μm. The composite drift mass density distribution is plotted in Figure 15. It shows a peak in the droplet size range of 30 to 50 μm with a center diameter of 40 μm. The largest value of droplet diameter for which the mass density distribution is shown

Table 5

COOLING TOWER COMPOSITE DRIFT MASS EMISSION PARAMETERS

d(center) (μm)	Δd (μm)	$\Delta X_i/\Delta d$ ($\mu g/m^3 \cdot \mu m$)	Composite Drift Mass Emission Rate, ΔD_i (μg/s)
20	20	29.5	2.78E 05
40	20	44.1	4.14E 05
65	30	40.2	5.61E 05
95	30	31.9	4.40E 05
130	40	24.7	4.46E 05
175	50	17.3	3.82E 05
225	50	12.0	2.57E 05
275	50	7.6	1.58E 05
325	50	5.7	1.16E 05
375	50	4.8	9.41E 04
425	50	4.4	8.37E 04
475	50	3.7	6.89E 04
525	50	3.4	6.12E 04
575	50	3.4	5.83E 04

Note: 2.78E 05 means 2.78×10^5

TOTAL COMPOSITE DRIFT MASS EMISSION RATE, $\Sigma\Delta D_i$ = 3.42 gm/s

MASS MEDIAN DIAMETER of the composite drift mass density distribution, $\Delta X_i/\Delta d$ = 120 μm

COMPOSITE TOWER DRIFT FRACTION (based on the design flow rate of 1260 kg/s) = 0.00027%

FAN STACK EXIT AREA, A = 54.5 m^2

TOTAL COMPOSITE DRIFT FLUX, $\Sigma\Delta D_i/A$ = 0.063 $gm/m^2 \cdot s$

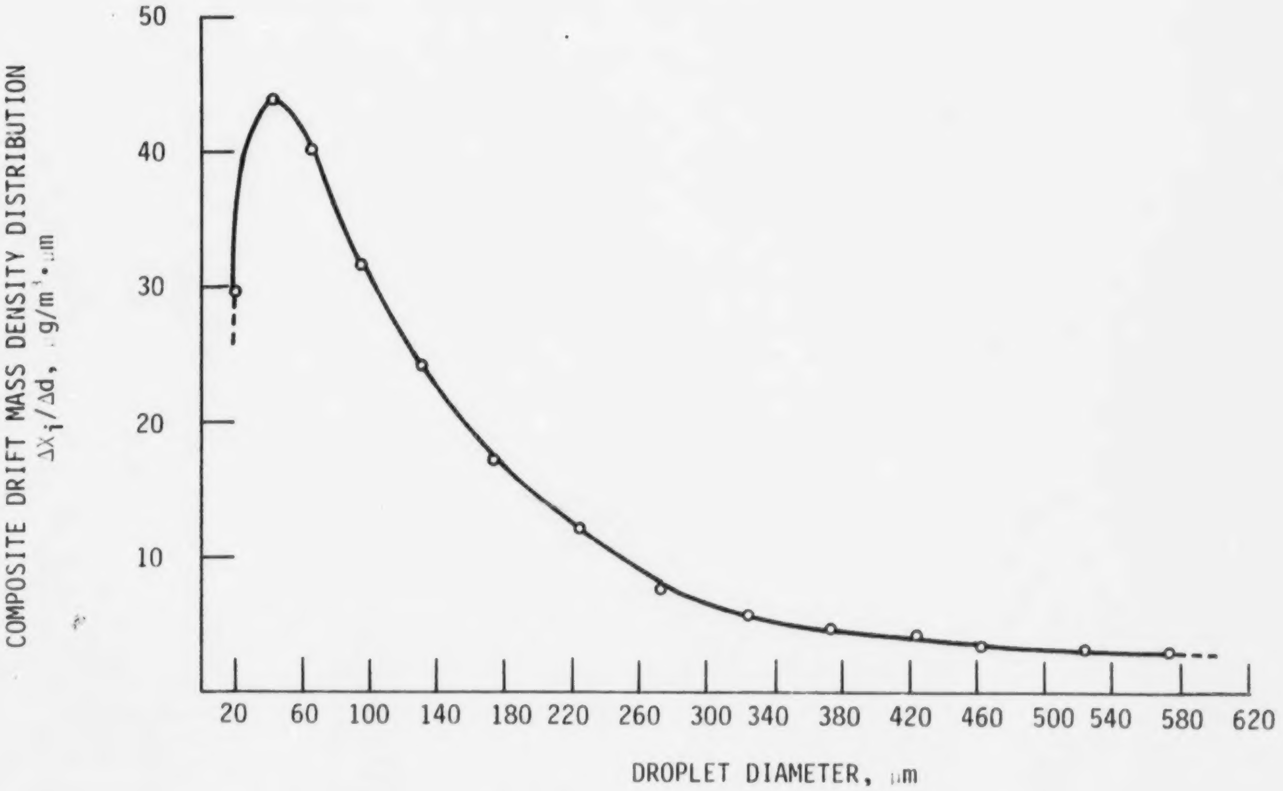


Figure 15. Cooling tower composite drift mass density distribution.

is 575 μm. This does not imply that no drift mass exists above this value. As mentioned above, the PILLS/SP data were given in the data sheets only up to this value of droplet diameter because the statistical quality of the data prevented the formulation of a p(d) value beyond that point whose accuracy lay within the accuracy limits previously stated for PILLS. Consequently, this composite curve which was calculated from the p(d) values tabulated for each position and each diameter, is also shown only up to 575 μm. The curve is dashed beyond this point to indicate that the drift mass density distribution may extend beyond this point. For small droplet diameters the curve is likewise limited by the accuracy of sizing small droplet stain sizes, as well as by the collection efficiency of the sensitive paper.

SPRAY MODULE EMISSION TEST

The spray module emission test was performed in two parts. The first part was begun full scale on January 30, 1974. On February 18, the test was broken off at the request of EPA and the equipment moved to the cooling tower so that measurements could be made simultaneously with EPA's vapor plume measurements. Once the cooling tower test was completed, the equipment was moved back to the barge and the spray module test resumed. The second part of the test began on March 18 and the test was completed on March 31. No testing of the spray modules was conducted during the summer campaign.

Measurement Set-Up

The task of measuring the drift emission of the spray modules presented different problems from those of the cooling tower test. Unlike the tower, where all drift is emitted through a well defined exit plane with an opening of approximately 55 m^2, the drift from the spray modules is emitted in all directions into the open air. When observed away from the spray modules, the drift is a strong function of ambient weather conditions, especially wind speed and direction. The measuring instruments had to be mounted such that they could be easily positioned throughout the region of space surrounding the spray modules. For this purpose, a barge was constructed and the instruments were mounted on a 13 meter tower which was raised on the barge. The barge could be positioned in the cooling canals downwind of the spray modules and the instrument package could be moved up and down the tower and positioned at various heights above water level. As a result, sampling points could be chosen over a large region of space where the instrument sensors could make drift measurements. An instrumentation shack on the barge was used to house the instrument control equipment and protect it from effects of the salt water drift and adverse weather. Two motor generator sets were used as sources of electric power on the barge so that the resulting system was completely independent of power support from shore. The barge was powered through the water by an outboard motor.

The instrument package was essentially the same as that on the cooling tower except for the changes discussed below which facilitated the data acquisition process. The PILLS, IK, Gill anemometer and wet bulb/drybulb psychrometer were used unchanged on the barge except for differences in the mounting geometry. Because of maximum air velocities which were one-third to one-half of those experienced on the cooling tower, the rotating type SP machine was used on the barge. Before the second part of the test began a Weather Measure wind vane was added to the instrument package. It delivered a voltage signal corresponding to wind direction referenced to the front of the barge. When this signal was fed into the PHA and recorded during a drift measuring interval, the result was a recording of the amount of time the wind had come from each direction. Likewise, the output of the Gill anemometer was stored in the PHA and gave the amount of time during the run that the wind had a certain velocity. The position of the other instruments in relation to PILLS' sampling volume is shown in Figures 16 and 17. The wind vane had not been added yet when the photograph was taken.

Measurement Procedure

In order to make a drift measurement run, the barge was moved into position downwind of the spray modules. The barge was then attached to the spray module array by a rope yoke with a slip knot and allowed to swing freely in the wind. In this manner it was intended that the barge would follow changes in wind direction and remain in the drift plume. This idea was successful for slow variations in wind direction. However, at times, the wind varied quite rapidly (30 degrees or more in a few seconds) and the barge, due to its large inertial mass, was unable to follow this type of wind variation. During the second part of the test, the wind variation data was recorded, however, in the PHA, as explained above, and is included with the data at the end of this report. Also, at times, particular measuring points placed the barge in a position such that it was essentially held by the canal current and could not easily follow even slow variations in wind direction. This happened only when the wind was from the NE and only when the barge was in one of the cooling canals that ran perpendicular to the feeder canal (less than 15% of the time). For the majority of measurements the barge remained in the feeder canal west of the spray modules. A diagram showing the spray module position in the cooling canal is shown in Figure 31 and Appendix G.

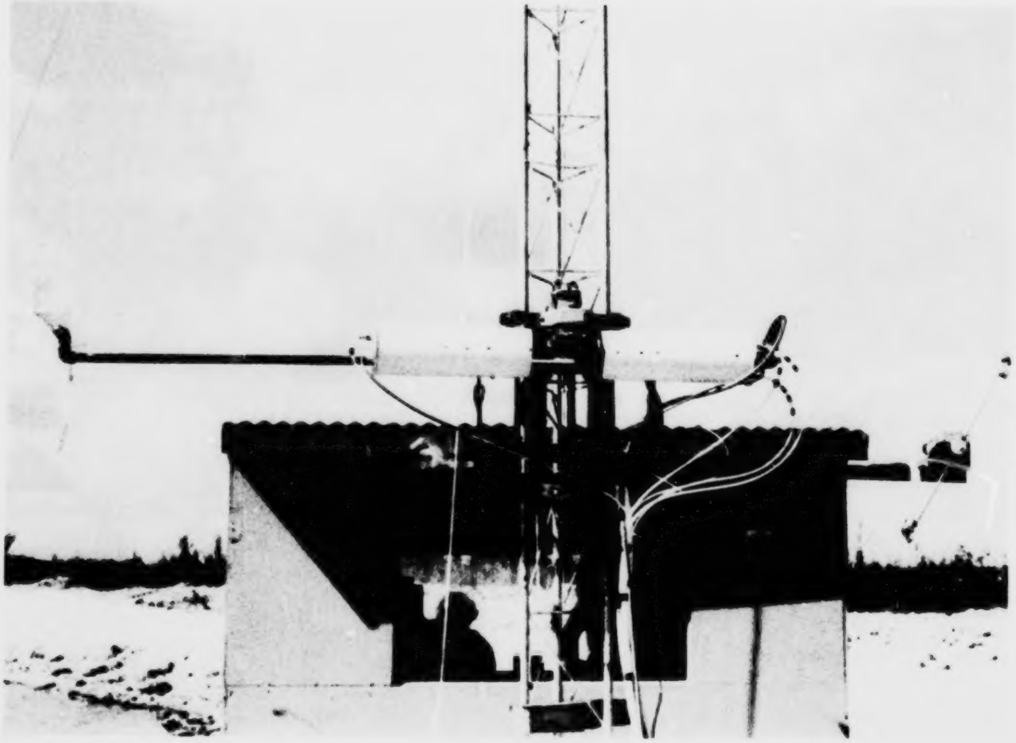


Figure 16. Barge instrument package showing also a part of the barge tower and the instrument shack. Center: PILLS instrument. Directly above: the wet bulb/dry bulb psychrometer. On the viewer's right: the Sensitive Paper machine. On the left: the Gill anemometer. A Weather Measure wind vane was later added directly above the anemometer. The U-tube of the Isokinetic Sampling System is visible below the PILLS instrument on the left side of the tower.

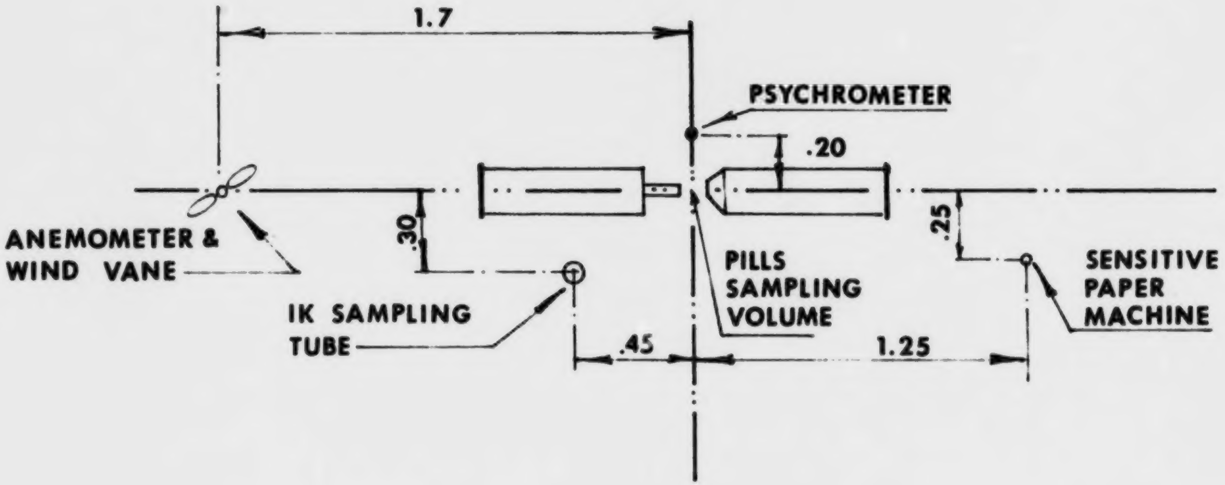


Figure 17. Position of the barge instrumentation relative to PILLS' sampling volume. View in downwind direction. Distance in meters.

The northwest spray module nozzle was used as a reference point for the barge position in relation to the array of spray module nozzles when the barge was west of the modules. The northeast spray module nozzle was the reference when the barge was east of the modules. At each measuring point the distance from the reference point to the instrument tower was recorded along with the height of the instrument package above water level. As already mentioned, the position of the PILLS sampling volume was used as the reference above water level. Along with distance from the nozzles and height above water level, the direction of the barge from the spray nozzles was taken in terms of azimuthal degrees where magnetic north was referenced at zero. This number represents a visual estimate of the position of the barge during the major portion of the run at a particular sampling point and was judged accurate within ±10°. These three numbers, distance from spray module, height above water level and azimuthal position pinpoint the position of the instruments at each sampling position.

Since the spray modules were positioned in the canal approximately 10 meters from the north bank, it was not feasible to make drift measurements when the wind came from the south. There was not enough room in the canal north of the spray modules for the barge to make measurements since the amount of drift within 10 meters from the spray modules with a south wind was heavy enough to saturate the instruments. In fact, the transformer supplying power for the cooling tower and spray modules shorted out under such conditions. It is situated on the north bank of the canal at a distance of about 24 m from the nearest spray module and was thus exposed to the drift whenever the spray modules were operating and the wind came from the south. To relieve this problem a shield was constructed after the winter test around the transformer to protect it from drift. For these reasons the spray module testing was suspended during days with southerly winds (March 19 - 25 and March 28 - 29). This time was utilized for instrument calibrations, maintenance, and data reduction. Furthermore, a dew point meter, mounted to the 10 m meteorological tower, was made operational.

A typical test at a sampling position would last anywhere from 20 minutes to 2½ hours, depending on the drift rate. The test was begun by moving the barge to an assigned distance from the reference spray nozzle and positioning the instrument package at an assigned height on the barge tower. Preliminary runs with PILLS and SP established a range of instrument positions for drift measurement. These points ranged from 2.4 to 11.0 meters above water level and from 20.7 to 88.4 meters downwind of the spray modules.

Once the barge was in position an unexposed IK tube was attached to the suction hose. PILLS and IK were then started up together to run continuously through the sampling period. The PILLS data were recorded by the PHA along with wind speed and direction referenced to barge orientation. Unlike the tower test, it was possible to expose sensitive papers without moving the instrument package. Two or three sensitive papers were usually exposed during a run. Since it was observed that variations in wind speed and direction could deliver bursts of drift for a few seconds then almost nothing shortly thereafter, each exposure of a sensitive paper was composed of multiple sets of short exposures taken at random. This procedure was to insure that the sensitive paper technique yielded drift parameters that represented time-mean values for the period of time PILLS and IK sampled at a position. At the end of a measurement period, the exposed IK tube was removed and sealed for analysis and the PILLS data and wind information were recorded from the PHA. PILLS data, IK data, wind speed and wind direction data were recorded continuously during a drift measurement run.

In order to compare the influence of ambient weather conditions on the drift, multiple runs were made at approximately the same position. The exact number varied from position to position. Also, on March 31, the normal procedure of allowing the barge to follow the wind was not observed so that the drop-off in drift across the plume in the crosswind direction could be measured. These are the runs started at 13:45 and 14:41 on March 31 for reference to the data section. For these runs, the instrument package was positioned 4.6 meters above the water level. The barge was positioned close to the sides of the cooling canal by means of a rope which extended across the canal. During these runs, the front of the barge faced directly east, otherwise, the measurement procedure was the same as described above.

Data Format

The measurement data from the spray module test are presented in Appendix G. The drift emission data are presented on sheets very similar to those used for the cooling tower drift data. Wind speed and direction data referenced to barge orientation are included separately, but correspond to the drift data positions and sampling times.

The first type of data sheet is the PILLS/SP droplet size distribution data sheet. Each measurement run is shown on a separate sheet with reference to the corresponding IK data sheet and wind data sheet, if available. The sampling point is defined by three numbers, as explained previously. Hence (20.7/280/4.3) is the point 20.7 meters from the NW spray nozzle, 280 degrees clockwise from north, and 4.3 meters above water level. It should be reiterated that in the case of westerly winds when the barge was positioned east of the modules, the reference point became the NE spray nozzle. The explanation of the nomenclature for the PILLS/SP droplet size distribution data has been explained in the cooling tower data format section and hence will not be repeated here. Relevant ambient meteorological information at the time of the run (average wind speed and direction, wet bulb/dry bulb air temperatures) is included on this sheet together with conditions at the instrument package (wet bulb/dry bulb air temperatures, wind speed and direction distribution) and the canal water temperature. Data from the isokinetic sampling system is presented on three data sheets at the end of the PILLS/SP data sheet group. Each IK measurement point is listed according to position, date and time. The nomenclature on these sheets is the same as that on the cooling tower data sheets, except that the time-mean wind speed $\bar{u}$ at the measurement point replaces the time-mean updraft velocity $\bar{v}_u$ for the calculations of adjusted mineral mass flux. As indicated by Table I, no canal water analyses are available between 3/16 and 3/30, 1974, due to loss of the water samples. Telephone communication with FP&L established that the sodium concentration did not change more than ±3% around the average value of the concentrations measured on 3/15 (11,875 mg/l) and 3/31 (11,575 mg/l). Thus the concentration data obtained on 3/15 were utilized to reduce the IK data of 3/18 and 3/19 whereas the canal water concentration of 3/31 was used to reduce the IK data obtained on 3/26 or earlier.

It should be noted that the final values in both PILLS/SP and IK data take the form of drift water flux and adjusted mineral mass flux, respectively. If such data could be obtained within a plane that is perpendicular to the wind velocity, the flux data could be integrated over the geometrical extent of the drift plume in that plane to yield the total mass of drift water or the adjusted mineral mass emitted by the spray modules. However, to obtain such flux data together with the geometrical extent of the drift plume, winds sufficiently steady in both direction and speed are necessary over an estimated period of 8 to 12 hours for the instruments and techniques described. The quantification of "sufficiently steady" could be one of the results of an analysis of these data.

The third type of data sheet in this appendix presents the wind speed and direction data recorded on the PHA during each sampling period. These sheets give the percentage of total time during the sampling period that the wind was in a certain wind speed range and was from a certain wind direction in relation to the barge orientation. These data indicate the amount of angular variation in wind direction with the front of the barge referenced as 0°, plus the per cent of time the wind came from each direction.

Initially, problems were encountered on the barge with conditioning the signals from the anemometer and wind vane for input to the pulse height analyser (PHA). These difficulties account for the occasional absence of this data in the wind speed and direction distribution tables corresponding to the runs made before March 27, 1974. It was not foreseen before the spray module test that the wind speed and direction data would be stored in the PHA. Consequently, in the first part of the test, this mode of data acquisition was given low priority and when these data are not shown, the data from the wind instruments on the meteorological tower must be consulted instead.

Spray Module Data Analysis Example

Some examples of data extracted from the spray module data section and displayed in graph form are given in Figures 18 to 22. Each figure represents PILLS/SP or IK data as a function of height above the water level for a fixed distance from the spray modules. Drift flux and mass median diameters are plotted in Figures 18, 19, and 21. Sodium and magnesium mass flux are plotted in Figures 20 and 22. Figures 19 and 20 illustrate data measured at the same time and position by the PILLS/SP and the IK system, respectively. A comparison between the two figures shows that both drift flux and adjusted mineral mass flux decreased with increasing height above water. A comparison of Figures 21 and 22 also shows a similar relative agreement. That is, the drift flux and mineral mass flux are highest for the middle value of height above water.

These graphs are not meant to be comprehensive by any means, but merely serve to illustrate some rudimentary data manipulation and grouping which might preface a full scale data analysis effort. These graphs illustrate change of PILLS/SP data with height. Other means of illustrating the results such as plots of the data vs. wind speed, distance from spray modules, etc., would also prove enlightening. However, as stated previously, a full scale, in-depth analysis was not within the scope of this report.

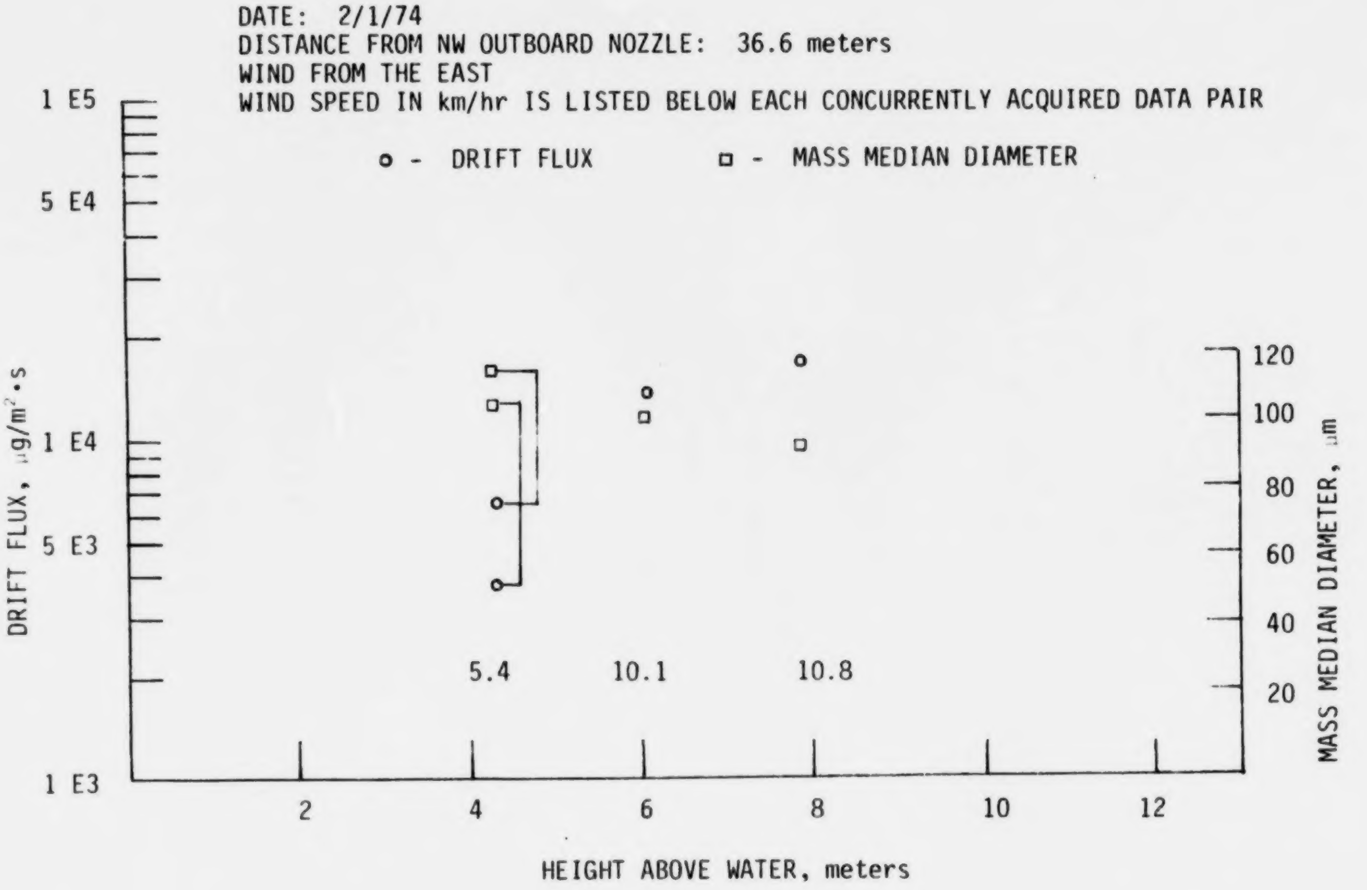


Figure 18. Spray module test: Drift flux, as measured by PILLS/SP, and droplet mass median diameter vs. measurement height.

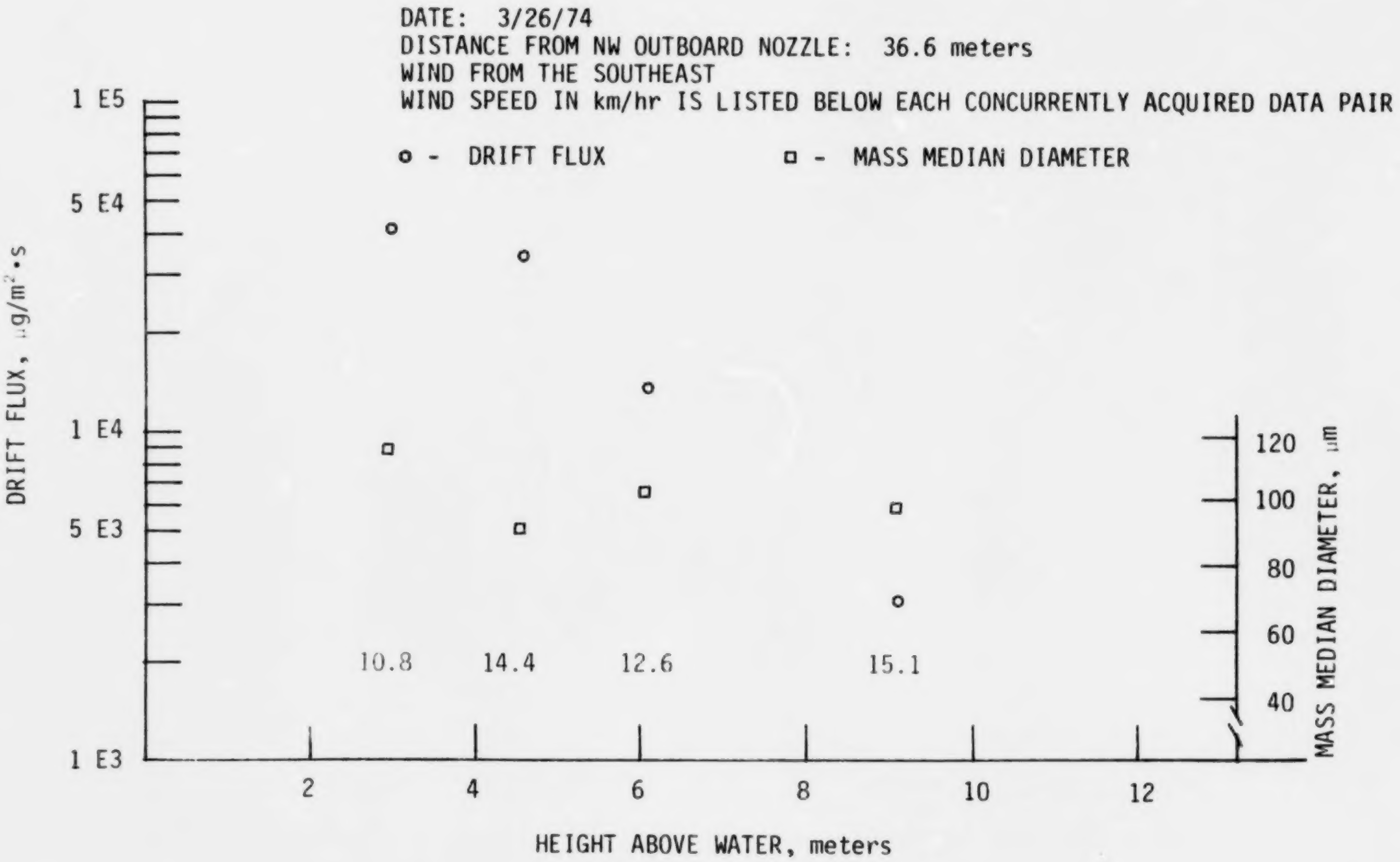


Figure 19. Spray module test: Drift flux, as measured by PILLS/SP. and droplet mass median diameter vs. measurement height.

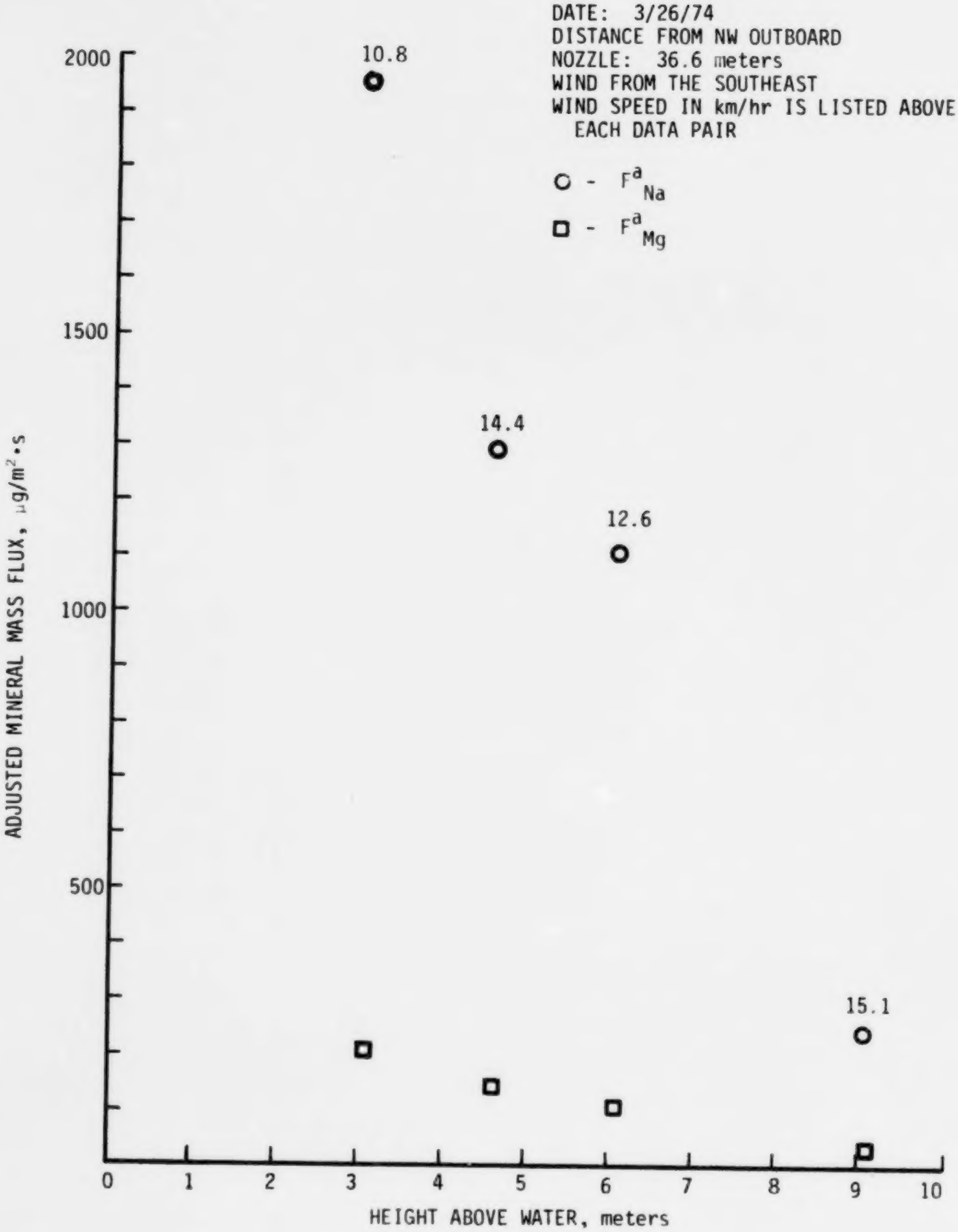


Figure 20. Spray module test: Adjusted mineral mass flux vs. measurement height.

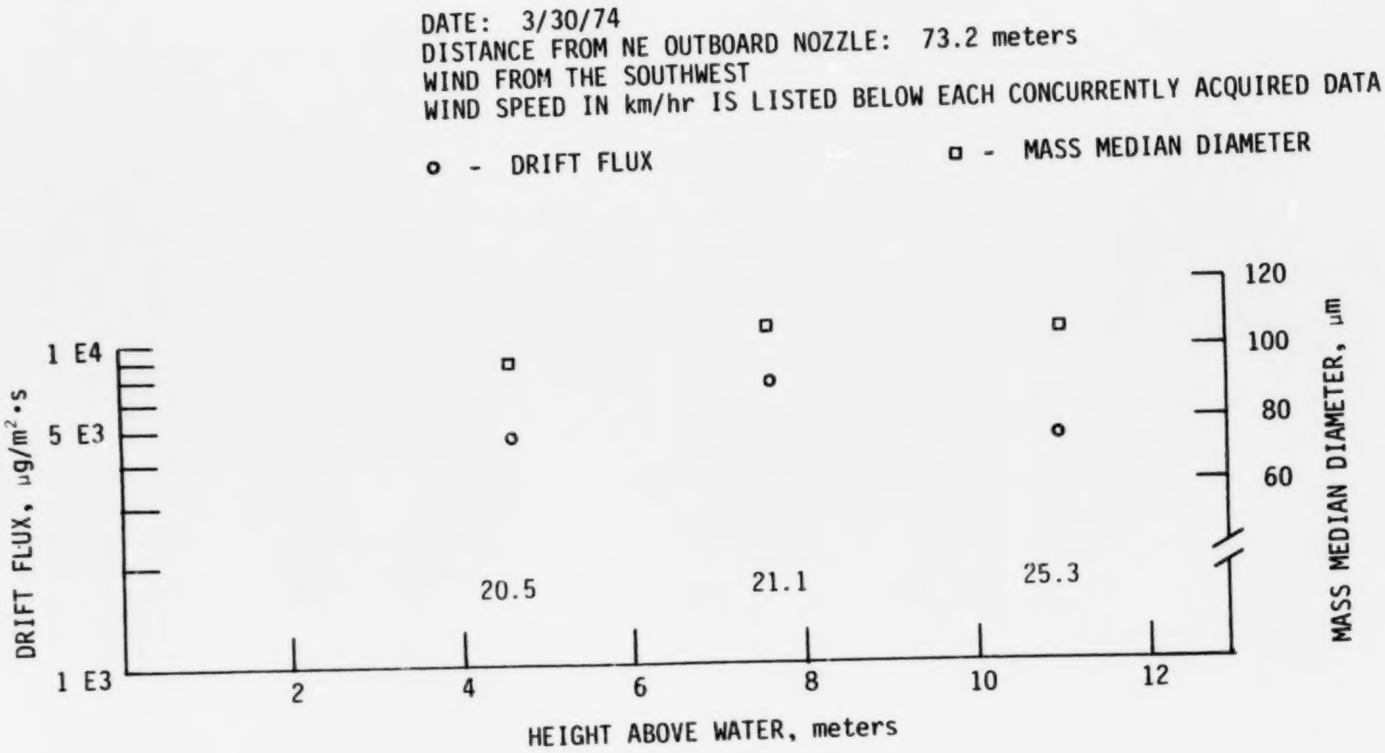

DATE: 3/30/74
DISTANCE FROM NE OUTBOARD NOZZLE: 73.2 meters
WIND FROM THE SOUTHWEST
WIND SPEED IN km/hr IS LISTED BELOW EACH CONCURRENTLY ACQUIRED DATA PAIR

Figure 21. Spray module test: Drift flux, as measured by PILLS/SP, and droplet mass median diameter vs. measurement height.

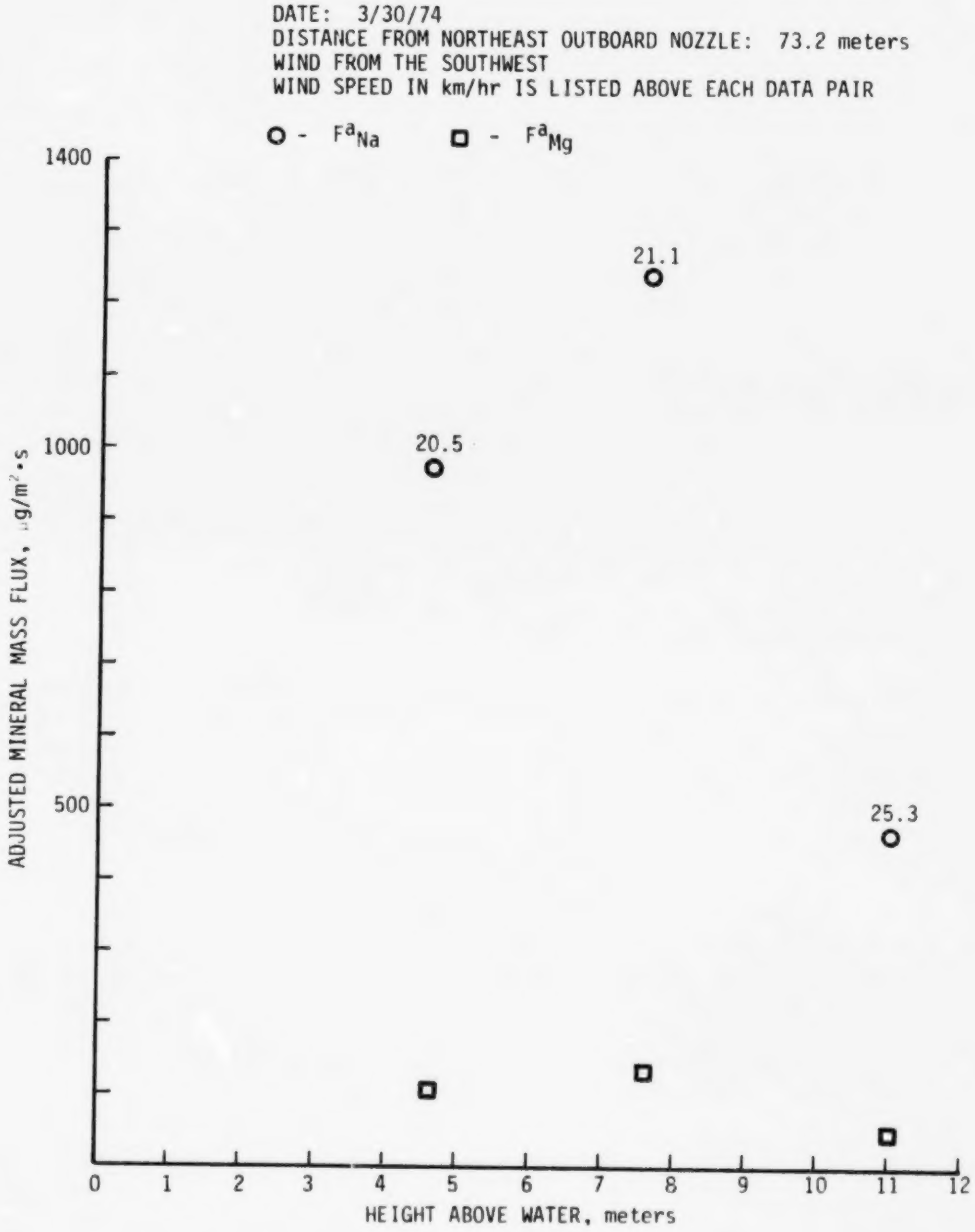


Figure 22. Spray module test: Adjusted mineral mass flux vs. measurement height.

SECTION VIII

REFERENCES

1. An Evaluation of the Feasibility of Salt Water Cooling Towers for Turkey Point. For Florida Power & Light Company by Southern Nuclear Engineering, Inc., Dunedin, Florida. Report No. SNE-54. February 1970.

2. Henderson, C.D., and S.H. Dowdell. A Test Program on Environmental Effects of Salt Water Mechanical Cooling Devices. Florida Power & Light Company. (Presented at the Cooling Tower Environment - 1974 Symposium. Washington, D.C., March 4-6, 1974) 15 p.

3. CANALS COOL FLORIDA'S STATION DISCHARGE. Electrical World. 182(4):39-41, August 1974.

4. United States District Court for the Southern District of Florida. Final Judgement, Civil Action No. 70-328-CA. September 10, 1971.

5. Environmental Systems Corporation. Development and Demonstration of Low-Level Drift Instrumentation. U.S. Environmental Protection Agency. Washington, D.C. EPA-16130GNK10/71. October 1971.

6. Rainwater, F. Unpublished Memorandum. U. S. Environmental Protection Agency. Corvallis, Oregon. October 1973. 2 p.

7. An Evaluation of the Powered Spray Module for Salt Water Service for Turkey Point. For Florida Power & Light Company by Southern Nuclear Engineering, Inc., Dunedin, Florida. Supplement No. 1 to SNE-54. May 1970.

8. Final Environmental Statement Related to Operation of Turkey Point Plant. U.S. Atomic Energy Commission, Washington, D.C. July 1972.

9. Shofner, F.M., G.O. Schrecker, T.B. Carlson, and R.O. Webb. Measurement and Interpretation of Drift Particle Characteristics. Environmental Systems Corporation. (Presented at the Cooling Tower Environment - 1974 Symposium. Washington, D.C. March 4-6, 1974.) 23 p.

10. Shofner, F.M., Y. Watanabe, and T.B. Carlson. Design Considerations for Particulate Instrumentation by Laser Light Scattering (PILLS) System. ISA Transactions 12. January 1973. 21 p.

11. Shofner, F.M. Explicit Calibration of the PILLS II System. By Environmental Systems Corporation for the U. S. Environmental Protection Agency. Washington, D.C. EPA-660/2-73-011. September 1973.

12. Chilton, H. Elimination of Carryover from Packed Towers with Special Reference to Natural Draught Water Cooling Towers. Trans. Instn. Chem. Engrs. 30:235-250. 1952.

13. Golovin, M.N., and A. A. Putnam. Inertial Impaction of Single Elements. Battelle Memorial Institute. Columbus, Ohio. I&EC Fundamentals 1(4):264-273. November 1962.

14. Margetts, M.J., and F.M. Shofner. Characterization of the Drift Emissions of a Natural Draft Cooling Tower and Examination of the Sensitivity to Operational Parameter Variations. (Presented to the Joint Power Generation Conference. New Orleans, Louisiana. September 16-19, 1973.) 9 p.

15. Shofner, F.M., G.O. Schrecker, and K.R. Wilber. Characterization of Drift Emissions and Drift Transport for Representative Cells of the K-31 and K-33 Cooling Towers. Environmental Systems Corporation for Union Carbide Corporation. Oak Ridge, Tennessee. October 1972.

16. Jallouk, P.A., G.J. Kidd, Jr., and T. Shapiro. Environmental Aspects of Cooling Tower Operation: Survey of the Emission, Transport, and Deposition of Drift from the K-31 and K-33 Cooling Towers at ORGDP. Union Carbide Corporation Report Number K-1859. Oak Ridge, Tennessee. February 1974.

17. Holmberg, J.D. Private Communication. 1974.

18. Orr, C., Jr., K. Hurd, and W.T. Corbett. Aerosol Size and Relative Humidity. Journal of Colloid Science. 13:472-482 July 1958.

19. Wilber, K.R. An Experimental Approach to the Evaluation of Mesh Collection Efficiencies Using Mechanism of Inertial Impaction. Master's Thesis. University of Tennessee. June 1974.

20. Westinghouse Electric Corporation. The State of the Art of Saltwater Cooling Towers for Steam Electric Generating Plants. U.S. Atomic Energy Commission. Washington, D.C. February 1973.

21. Schrecker, G.O., K.R. Wilber, and F.M. Shofner. Prediction and Measurement of Airborne Particulate Concentrations from Cooling Device Sources and in the Ambient Atmosphere. Environmental Systems Corporation. (Presented at the Cooling Tower Environment - 1974 Symposium. Washington, D.C. March 4-6, 1974.) 21 p.

22. Schrecker, G.O., S.L. Williams, F.M. Shofner. Atmospheric Dispersion of Cooling Tower Blowdown. Environmental Systems Corporation. (Presented at the Symposium on the Physical and Biological Effects on the Environment of Cooling Systems and Thermal Discharges at Nuclear Power Stations. Oslo, Norway. August 26-30, 1974) 14 p.

23. Shofner, F.M., J.D. Womack, and K.R. Wilber. Ambient Sea Salt Measurements in the Forked River, New Jersey Environs July 1972 - August 1973. Environmental Systems Corporation for General Public Utilities. Parsippany, New Jersey. August 1973.

24. Rainwater, F., and J. Thatcher. Methods of Collection and Analysis of Water Samples. U.S. Geological Survey. Washington, D.C. Water Supply Paper #1454. 1960.

25. Glass, S.J. Jr., and M.J. Matteson. Ion Enrichments in Aerosols Dispersed from Bursting Bubbles in Aqueous Salt Solutions. Tellus. 15 March 1973.

SECTION IX

GLOSSARY

TEXT NOMENCLATURE

A_s - collection area of sampling device (sensitive paper, IK tube, APS mesh, deposition funnel)

APS - Airborne Particle Sampler

C_k - concentration of the K^{th} element or compound in the cooling water, mass of solute per unit volume of solution

$\overline{C}_k$ - average concentration of the K^{th} element or compound in the cooling water, mass of solute per unit volume of solution

$C_{k\ Ref}$ - reference concentration of the K^{th} element or compound in the cooling water, mass of solute per unit volume of solution

D - rate of drift mass emission

d_F - salt deposition flux, mass of salt per unit area and unit time

$\overline{d}_i$ - drift droplet center diameter for the droplet size range Δd_i

E_{disc} - collection efficiency of a sensitive paper disc collector

E_{strip} - collection efficiency of a sensitive paper strip collector

EPA - Environmental Protection Agency

ESC - Environmental Systems Corporation

F_{kj} -	flux of K^{th} element or compound at position j as defined by Equation (21)
F^{a}_{kj} -	adjusted flux of K^{th} element or compound at position j as defined by Equation (29)
FP&L -	Florida Power and Light Company
gm -	grams
i -	drift droplet size range index
IK -	hot glass bead Isokinetic Sampling System
j -	measurement position index
k -	chemical element or compound index
kg -	kilograms
km -	kilometers
l -	liters
Mass Median Diameter -	the droplet diameter at which half of the emitted mass is due to smaller droplets and half due to larger droplets
M_{ANa} -	collected mass of sodium attributable to ambient sea salt
M_{kj} -	mass of K^{th} element or compound measured at position j
M_{Na} -	mass of sodium stripped from an IK tube or an APS mesh pair
M_{Mg} -	mass of magnesium stripped from an IK tube or an APS mesh pair
m -	meters
m_k -	rate of mass emission of K^{th} element or compound
mg -	milligrams
mo -	month

$p(d)$ - particle density distribution as defined by Equation (1)

PHA - Pulse Height Analyzer

PILLS - Particulate Instrumentation by Laser Light Scattering

R - mass flow rate of the circulating water

RPM - rotations per minute

s - second

s_{cw} - density of the circulating water

s_i - representative density of drift droplets in size range i

s_w - density of pure water

$\overline{s}$ - average density of drift droplets of all size classes

SP - Sensitive Paper

t_s - sampling time

$\overline{u}$ - time-mean horizontal wind speed

V_s - sampled air volume

$\overline{v}_{uj}$ - vertical component of the time-mean air updraft velocity at position j

v_{ti} - settling velocity of a water droplet with diameter $\overline{d}_i$

β_i - sensitive paper correction factor for droplet size range i

Δ - drift fraction as defined by Equation (8)

ΔA_j - section of the cooling tower fan stack exit plane associated with position j

ΔD_{ij} - drift mass emission rate in the droplet size range i at position j

$\frac{\Delta D_{ij}}{\Delta A}$ - drift mass flux in droplet size range i at position j

Δdi - drift droplet size interval of droplet size range i

Δm_{kj} - rate of emission of the K^{th} element or compound at position j

Δm^{a}_{kj} - rate of adjusted emission of the K^{th} element or compound at position j

ΔN_{ij} - number of droplets in droplet size range Δd_i measured at position j

ΔX_{ij} - drift mass concentration in droplet size range i at position j, mass of drift droplets per unit volume of air

$\frac{\Delta X_{ij}}{\Delta d}$ - drift mass density distribution in droplet size range i at position j, mass of drift droplets per unit droplet size range and unit volume of air

m_k - mass fraction of the K^{th} element or compound as defined by Equation (25) and (26)

μg - micrograms

μm - micrometers

ϕ_{kj} - mass concentration of the K^{th} element or compound at position j, mass per unit volume of air

ϕ^{a}_{kj} - adjusted mass concentration of the K^{th} element or compound at position j, mass per unit volume of air

X_j - drift mass concentration at position j, mass of drift water per unit volume of air

X'_j IK (or X'_j) - drift mass concentration at position j as calculated from IK data with the assumption that the mineral concentration in the drift droplets is the same as that of the cooling water (apparent drift mass concentration)

Θ - angle between magnetic north and a line from reference position of the spray modules to PILLS' sampling volume

DATA SECTION NOMENCLATURE

C - APS data comment code

$\bar{C}_{Mg}$ - average concentration of magnesium in basin or canal water

$\bar{C}_{Na}$ - average concentration of sodium in basin or canal water

D(CEN) - center diameter of droplet size range DEL D

D(HI) - upper droplet diameter of size range DEL D

D(LOW) - lower droplet diameter of size range DEL D

d - distance from spray module reference point to measurement position

DEL D - same as Δd_i in text

DEL X - same as ΔX_i in text

DEL X/DEL D - same as $\Delta X_i/\Delta d$ in text

DEL FLUX - same as $\Delta D_{ij}/\Delta A$ in text

DEP - same as d_F, sea salt deposition flux

h - height of instrument package above water level during spray module test

I - drift droplet size range index

P(D) - same as p(d), particle density distribution

PHI - same as ϕ, air salt concentration

T_a - tower exit air temperature

T_{dry} - ambient dry bulb temperature

T_i - hot water temperature

T_o - cold water temperature

T_{wet} - ambient wet bulb temperature

SECTION X

APPENDICES

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APPENDIX A

CHRONOLOGY OF EVENTS

In order to provide an overview of the proceedings of the contract work, the major events and time periods of the contract are listed in chronological order in the following:

June 29, 1973: Contract award.

July 1 - August 23, 1973: Definition of the test program; construction and installation of APS equipment.

August 7, 1973: Turkey Point briefing session in Knoxville, Tennessee. Discussion and finalization of the Turkey Point test program. Attendees: representatives of EPA offices in Corvallis and Research Triangle Park, National Oceanic and Atmospheric Agency, FP&L, and ESC.

August 24 - November 22, 1973: Intensive ambient airborne sea salt sampling program (5 runs/week).

November 23, 1973 - January 30, 1974: Less intensive airborne sea salt sampling program (3 runs/week).

November 27 - December 17, 1973: Construction of the barge and installation of the barge rigging. Construction and installation of the cooling tower rigging. Assembly and installation of two spray modules.

December 7, 1973: Delivery of the "Preliminary Ambient Salt Sampling Report" to EPA and FP&L.

January 21 - 23, 1974: Arrival of ESC test crew on site. Start of winter test. Installation of the test equipment into the cooling tower rigging and shakedown. First exploratory-type tests on the cooling tower. Termination of the tests due to cooling tower water pump failure.

January 24 - 29, 1974: Test equipment is removed from cooling tower and installed into the barge rigging. Start of spray module emission test was delayed by unfavorable wind directions. Installation of 10 m meteorological tower east of the cooling tower.

January 30 - February 2, 1974: Spray module drift emission test. Start of intensive airborne sea salt sampling program (5 runs/week) during the operation of one of the cooling devices.

February 4 - 6, 1974: Reduction of data acquired during January 30 - February 2. Review of data and test procedure.

February 7 - 11, 1974: Extension of barge tower from 30 to 40 ft. height. Installation and calibration of meteorological equipment on 10 m tower.

February 12 - 18, 1974: Resumption of spray module drift emission test.

February 15, 1974: Turkey Point briefing session at Homestead, Florida. Presentation and discussion of data acquired during the spray module emission test. Presentation and discussion of preliminary ambient sea salt data analyses performed by EPA Corvallis. Discussion of satellite program at Turkey Point. Attendees: representatives of EPA Office of General Counsel, EPA offices at Corvallis, Research Triangle Park and Atlanta, FP&L, Ceramic Cooling Tower Company and ESC.

February 19 - 22, 1974: The spray module emission test was interrupted because EPA asked for concurrent cooling tower drift emission and vapor plume tests. The plume test was to be conducted by an EPA test crew. ESC's test equipment was moved from the barge to the cooling tower. Shakedown of equipment.

February 21 -26, 1974: Measurement of velocity and temperature profiles on the cooling tower. Cooling tower drift emission test concurrent with EPA's plume test.

February 27 - March 8, 1974: Interruption of test and review of acquired cooling tower drift emission data. This unscheduled review was initiated because EPA requested a deferral of the spray module test until March 12-15 to accomodate the terrestrial effect studies of Dr. L. Raniere, NERL, Corvallis, who needed continuous cooling tower operation during this period of time.

March 9 - 15, 1974: Resumption and conclusion of the cooling tower drift emission test.

March 16 - 17, 1974: Test equipment moved from cooling tower to barge.

March 18 - 31, 1974: Resumption and conclusion of spray module drift emission test.

April 1, 1974: Start of increased frequency of airborne sea salt sampling during operation of one of the cooling devices. The frequency was increased from 5 to 6 runs per week.

April 1 - 3, 1974: Removal of the PILLS, IK and SP equipment from the site. Conclusion of winter test.

April 1 - June 30, 1974: Data reduction and Interim Report preparation.

July 3, 1974: Delivery of the Interim Report to EPA and FP&L

July 1 - 15, 1974: Preparation for the summer test.

July 16 - 19, 1974: Arrival of ESC test crew on site for the Summer Test. Installation of the equipment into the cooling tower rigging.

July 19, 1974: Termination of the airborne sea salt deposition flux monitoring program which is one part of the airborne sea salt sampling program. The other part, the airborne sea salt concentration monitoring program, is continued.

July 19 - 24, 1974: Drift emission test on the SW-NE diameter of the cooling tower.

July 24, 1974: Termination of the data acquisition at Turkey Point.

July 24 - 26, 1974: Removal of ESC equipment from the site.

August 8, 1974: Turkey Point briefing session at Atlanta, Georgia: ESC reported on the amount of data acquired at Turkey Point. It was discussed particularly whether the data satisfied the provisions set forth in the court decree. This question was answered affirmatively. Discussion of the Interim Report and of the format of the Final Report. Attendees: representatives from the EPA offices in Corvallis, Research Triangle Park and Atlanta, FP&L, The Marley Company and ESC.

August - September, 1974: Reduction of the recently acquired and examination of all airborne sea salt concentration and airborne sea salt deposition flux data.

September - November, 1974: Reduction of the recently acquired and examination of all PILLS, SP and IK data.

October 1, 1974: Delivery of all airborne sea salt concentration data to EPA.

November - December, 1974: Preparation of the first draft of the Final Report.

December 21, 1974: Delivery of the first draft of the Final Report to EPA and FP&L.

April 12, 1975: Delivery of the second draft of the Final Report to EPA and FP&L.

June 17, 1975: Delivery of the third draft of the Final Report to EPA and FP&L.

APPENDIX B

COOLING TOWER AND POWERED SPRAY MODULES OPERATIONS LOG

Date	Spray Modules	Cooling Tower
Prior to Jan. 21		Tower was run a total of approximately 12 hours by The Marley Company.
Jan. 21		6 hours
22	1100-1600, 1700-1800	1300-1630
23	ran about 30 minutes around 1700	1030-1500
24		
25		
26		1200-1730
27		
28		
29	1000-1800	
30	0900-1900	
31	0830-1900	
Feb. 1	0830-1910	
2	0900-1330	
3		
4		
5		
6		
7	1130-start 24 hr. operation	
16	off 1000-transformer down	
18	1000-1900	
19		1045-1730
20		0945-1915
21		0930-start 24 hr. operations

COOLING TOWER AND POWERED SPRAY MODULES OPERATIONS LOG (continued)

Date	Spray Modules	Cooling Tower
Mar. 18	1300-1900	off 0800
19	1000-1300	
20		
21		
22	0930-0935	
23		
24		
25	0900-0905	
26	1100-1500	
27	1535-1845	
28		
29		
30	1320-1355, 1530-1940	
31	1210-1730	
Apr. 8		on 0830
14	0800-2300 transformer down	off 0800
17	on 1600	
21	off 1640	on 1640
28	on 0900	on 0900
May 5	off 0800	on 0800
13	on 1025	off 1025
19	off 0800	on 0800
26	on 0800	off 0800
June 2	off 1455	on 1455
9	on 0800	off 0800
16	off 0800	on 0800
23	on 0800	off 0800
30	off 1050	on 1050
July 7	on 0800	off 0800
14	off midnight	
15	0940-1330	
16	0740-1315	
17		on 0940
25		off 1515

APPENDIX C

AIRBORNE PARTICLE SAMPLER DATA

C-1 APS Data

C-2 APS Procedural Background Data

C-3 APS Mesh Background Data

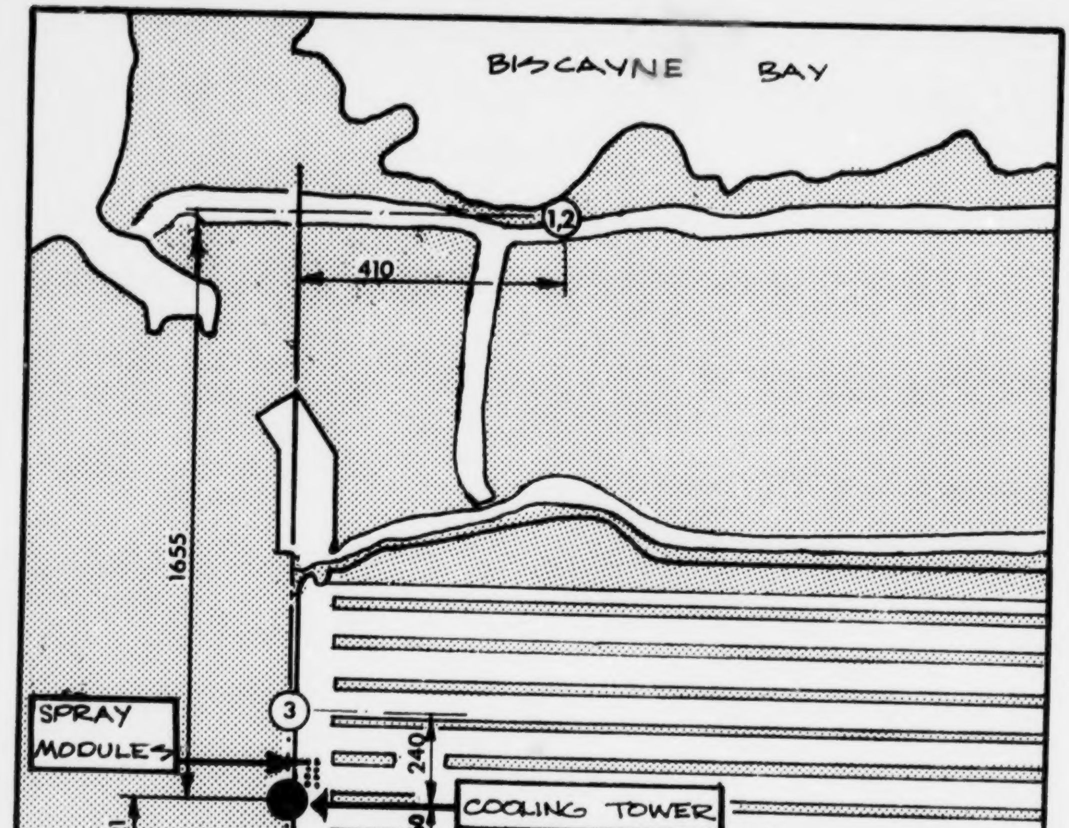

Figure 23. Airborne Particle Sampler station locations. Distances in meters.

APPENDIX C-1

APS DATA

FORMAT FOR DATA PRESENTATION - AIRBORNE PARTICLE SAMPLER DATA

Note: For more detailed descriptions of column headings see text Section VI "Formats for Data Presentation".

ST #	Identification of APS sampling station location.
PHI	Apparent atmospheric sea salt concentration, μg/m3.
C	Comment code: 0 - good run 1 - sample caught in light rain 2 - sample caught in heavy rain 3 - possible contamination due to insects on the mesh-pair. 4 - possible contamination from dust. 5 - other comments or a combination of the coded comments; supplemented with a written footnote. 9 - whitecaps on the bay.
VOLUME	Volume of air sampled by the mesh-pair for the run, m3.
NET SODIUM	Total sodium as verified by chemical analysis minus the average procedural background for the mesh pair, μg of sodium.
TIME	Time of day at the start and end of a run. (Note: daylight sampling only.)
WINDSPEED	Average wind speed measured for one minute at the start and end of a run, km/hr.
WIND DIR	Direction from which the wind is blowing at the start and end of a run, represented by integers from 1 to 16 corresponding to a 16-point wind rose with 1 as north, 5 as east, 9 as south, and 13 as west.

DRY BULB TEMP & DIFF	Dry bulb temperature and the difference between the dry bulb and wet bulb temperatures measured at the start and end of a run, °C. Example: Run #1, station #3. T_{dry} (start)=31.1°C, T_{wet} (start)=27.8°C, $T_{dry}-T_{wet}$=3.3°C; therefore, DRY BULB TEMP & DIFF = 31.1 & 3.3.
RELAT HUMID	Relative humidity at the start and end of a run, %.
COOLING DEVICE CODE	0 - no cooling device operating. 1 - cooling tower operating. 2 - spray modules operating.

Note: Input data for all runs were checked at least twice and found to be correct. Input for runs containing results which appear to be "out of line" with concurrently-acquired data at other station locations were checked again for correctness, therefore, no written footnote to this effect will be included.

```
RUN#   1    DATE:  8/24/73    COOLING DEVICE CODE=0

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
#                            SODIUM    START/END    START/END    START/END        START/END             HUMID

 3    0.18   2    198.1       11.0     1104/1306    19.4/ 6.4       8/ 7      31.1& 3.3/30.0& 1.7      77/88
 4    0.54   2    287.3       47.5     1033/1332    19.6/20.8       7/ 6      31.1& 3.3/31.7& 2.8      77/81
 5    0.94   2    403.3      116.3      955/1403    16.4/17.0       7/ 7      31.1& 3.3/32.8& 4.4      77/71
 6    3.54   1    313.3      339.3     1240/1553     8.0/18.8       7/ 6      32.8& 4.4/30.0& 1.7      71/88


RUN#   2    DATE:  8/24/73    COOLING DEVICE CODE=0

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
#                            SODIUM    START/END    START/END    START/END        START/END             HUMID

 4    5.01   0    111.6      171.3     1540/1650    22.0/16.4       5/ 6      30.6& 2.2/29.4& 2.2      85/84
 5    4.06   0    125.0      155.3     1520/1633    22.1/14.1       5/ 5      30.6& 2.2/29.4& 2.2      85/84


RUN#   3    DATE:  8/25/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 3.1%

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
#                            SODIUM    START/END    START/END    START/END        START/END             HUMID

 1    7.29   0    153.6      342.3     1301/1439    12.2/11.5       6/ 6      30.6& 3.3/31.1& 3.3      77/77
 2    7.05   0    127.5      275.3     1311/1429    12.2/11.5       6/ 6      30.6& 3.3/31.1& 3.3      77/77
 3    6.69   0    291.5      597.3     1214/1517    16.4/17.7       7/ 8      31.7& 3.9/31.1& 3.3      74/77
 4    7.00   0    348.6      747.3     1146/1532    19.1/17.8       7/ 7      31.1& 3.3/31.7& 3.3      77/78
 5    6.72   0    436.9      899.3     1123/1544    16.7/14.1       5/ 6      31.1& 3.3/32.2& 3.9      77/75
```

```
RUN#   4   DATE:  8/27/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 7.3%

ST   PHI   C    VOLUME     NET      TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM  START/END    START/END   START/END         START/END          HUMID

 1   5.59  0    357.6     612.3   1521/1849    17.6/20.1      4/ 4    31.1& 3.9/29.4& 3.3     74/77
 2   6.03  0    334.4     617.3   1524/1843    17.6/20.1      4/ 4    31.1& 3.9/29.4& 3.3     74/77
 3   5.12  0    437.6     685.3   1446/1918    22.1/18.0      4/ 4    30.5& 3.3/28.9& 2.8     78/80
 4   5.15  0    443.6     699.3   1427/1925    15.6/18.8      3/ 4    32.8& 3.9/29.4& 3.3     75/77
 5   5.50  0    537.7     905.3   1410/1934    12.8/13.7      3/ 3    32.2& 3.9/28.9& 2.8     75/80
 6   5.03  0    441.3     679.3   1314/1743    14.6/15.1      3/ 3    31.1& 4.4/31.1& 3.9     71/74
```

```
RUN#   5   DATE:  8/28/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR=11.9%

ST   PHI   C    VOLUME     NET      TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM  START/END    START/END   START/END         START/END          HUMID

 1   5.26  0    242.0     369.3   1155/1421    16.3/13.4      2/ 2    30.6& 3.9/30.6& 3.9     74/74
 2   5.96  0    227.5     415.3   1159/1424    16.3/13.4      2/ 2    30.6& 3.9/30.6& 3.9     74/74
 3   5.34  0    378.7     619.3   1117/1516    20.8/19.2      2/ 4    31.1& 3.9/31.7& 4.5     74/71
 4   5.50  0    402.1     677.3   1053/1526    15.2/16.6      2/ 4    31.1& 3.9/31.7& 4.5     74/71
 5   5.12  0    516.3     809.3   1033/1544    11.0/13.2      2/ 3    30.0& 3.3/32.8& 5.0     78/68
```

```
RUN#   6   DATE:  8/29/73   COOLING DEVICE CODE=1

ST   PHI    C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM   START/END    START/END   START/END        START/END          HUMID

 4   3.84   1    21.1      24.8    1107/1120   20.3/19.7      6/ 8     30.0& 2.2/26.7& 0.0     85/99
 5   2.66   1    77.9      63.3    1042/1129   18.6/20.5      6/ 8     28.9& 2.8/26.7& 0.0     80/99



RUN#   7   DATE:  9/ 4/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 1.74

ST   PHI    C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM   START/END    START/END   START/END        START/END          HUMID

 1   3.13   0   190.0     172.3    1149/1333   13.5/14.2      7/ 7     30.6& 3.4/31.1& 3.3     77/77
 2   3.18   0   173.9     169.3    1143/1335   13.5/14.2      7/ 7     30.6& 3.4/31.1& 3.3     77/77
 3   2.77   0   252.0     247.3    1104/1409   18.5/21.9      7/ 8     30.0& 3.3/31.7& 3.9     78/74
 4   2.64   0   334.2     269.3    1043/1420   17.8/18.7      7/ 7     30.0& 3.3/31.1& 3.9     78/74
 5   2.75   4   418.7     352.3    1020/1434   14.8/22.1      5/ 6     31.1& 5.5/31.0& 3.8     64/74
 6   1.61   0   496.4     245.3     930/1442   17.3/16.4      7/ 7     27.8& 2.2/31.1& 3.9     84/74
```

```
RUN#   8   DATE:  9/ 5/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR= 3.0%

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF      RELAT
 #                           SODIUM   START/END    START/END    START/END        START/END             HUMID

 1    5.56   0    168.9      287.3    1229/1408    14.5/16.3       5/ 6     28.9& 2.9/30.0& 3.3        80/78
 2    5.73   0    158.2      277.3    1233/1404    14.5/16.3       6/ 6     28.9& 2.9/30.0& 3.3        80/78
 3    5.91   0    309.0      559.3    1125/1431    19.2/15.3       6/ 7     28.3& 2.2/30.6& 3.4        84/77
 4    5.69   0    323.1      562.3    1112/1440    16.6/14.6       6/ 6     28.3& 2.2/30.0& 2.2        84/85
 5    5.60   0    380.3      652.3    1055/1447    11.8/16.7       5/ 5     27.8& 2.2/30.6& 2.3        84/84
```

```
RUN#   9   DATE:  9/ 6/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR= 0.7%

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF      RELAT
 #                           SODIUM   START/END    START/END    START/END        START/END             HUMID

 1    5.31   0    179.6      319.3    1133/1320    14.4/20.5       6/ 6     31.1& 3.9/31.1& 3.9        74/74
 2    5.85   0    178.3      319.3    1138/1323    14.4/20.5       6/ 6     31.1& 3.9/31.1& 3.9        74/74
 3    5.75   0    342.2      602.3    1025/1348    19.0/23.4       6/ 7     30.6& 3.9/30.6& 3.9        74/74
 4    5.67   0    364.6      632.3    1007/1355    23.8/25.2       6/ 6     30.0& 2.8/31.7& 3.9        81/74
 5    5.55   0    425.4      722.3     948/1403    14.0/30.7       5/ 6     29.4& 2.8/31.7& 3.9        81/74
```

```
RUN#  10   DATE:  9/10/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR= 2.3%

ST    PHI    C    VOLUME       NET       TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM   START/END    START/END    START/END        START/END            HUMID

 1   0.69    0    183.1        38.6   1128/1318    10.8/15.3      15/14     32.2& 5.6/33.9& 6.7      65/60
 2   0.70    0    169.6        36.6   1132/1320    10.8/15.3      15/14     32.2& 5.6/33.9& 6.7      65/60
 3   0.61    0    343.8        63.7   1009/1344    13.4/14.4      15/14     30.6& 3.3/33.9& 6.7      77/60
 4   0.62    0    378.0        71.5    950/1353     6.3/11.7      13/14     29.4& 2.2/35.0& 7.2      84/57
 5   0.51    0    474.7        74.1    934/1400     9.0/ 5.8      13/15     28.3& 1.7/34.4& 7.2      88/57
 6   0.55    0    393.5        67.9   1047/1452    14.4/10.2      12/14     32.2& 5.0/33.9& 7.2      68/57
```

```
RUN#  11   DATE:  9/11/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR= 1.4%

ST    PHI    C    VOLUME       NET       TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM   START/END    START/END    START/END        START/END            HUMID

 1   1.66    0     86.7        44.1   1329/1417    31.6/24.7      13/14     31.1& 4.4/30.0& 3.9      70/74
 2   1.68    0     93.2        42.9   1330/1419    31.6/24.7      13/14     31.1& 4.4/30.0& 3.9      70/74
 3   1.38    0    210.8        39.1   1236/1438    17.5/27.5      13/13     30.0& 4.4/30.0& 5.0      70/67
 4   1.30    0    263.6        96.6   1213/1447    17.8/26.8      12/14     28.9& 3.9/30.0& 4.4      73/70
 5   1.31    0    240.6        96.6   1150/1456    17.8/18.7      12/13     28.3& 3.3/29.4& 4.4      76/70
 6   0.96    0    435.1       128.3   1108/1529    18.7/22.1      12/14     30.6& 3.9/28.9& 3.9      74/73
```

```
RUN#  12   DATE:  9/12/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR=10.5%

ST    PHI    C   VOLUME       NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                          SODIUM    START/END    START/END   START/END        START/END             HUMID

 1    1.35   0   163.7        67.9    1214/1354     8.5/ 9.7       7/ 7     31.1& 3.9/31.7& 4.4      74/71
 2    1.21   3   159.2        59.1    1216/1356     8.5/ 9.7       7/ 7     31.1& 3.9/31.7& 4.4      74/71
 3    1.26   3   301.7       116.3    1112/1422     6.5/15.2       1/ 5     31.1& 3.9/31.1& 3.9      74/74
 4    1.17   0   366.8       131.3    1047/1437     4.4/14.6       1/ 6     30.6& 3.9/31.1& 3.3      74/77
 5    1.22   3   422.6       157.3    1027/1451     6.4/14.2      15/ 5     28.9& 2.8/32.2& 3.9      81/75
```

```
RUN#  13   DATE:  9/13/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 3.3%

ST    PHI    C   VOLUME       NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                          SODIUM    START/END    START/END   START/END        START/END             HUMID

 1    1.80   0   175.1        96.6    1158/1350     5.4/ 7.9       6/ 7     30.6& 3.3/33.3& 5.0      77/68
 2    1.86   0   174.2        99.3    1200/1352     5.4/ 7.9       6/ 7     30.6& 3.3/33.3& 5.0      77/68
 3    1.25   0   300.5       115.3    1057/1414     7.6/11.8       6/ 6     30.6& 3.3/31.1& 3.9      77/74
 4    1.86   0   362.7       206.3    1035/1426     8.0/13.3       5/ 9     30.6& 3.3/31.1& 3.9      77/74
 5    1.78   0   409.3       223.3    1010/1439     9.9/10.0       5/ 9     31.7& 3.3/31.7& 5.0      78/68
```

```
RUN#  14   DATE:  9/14/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR= 7.7%

ST    PHI    C    VOLUME       NET        TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF      RELAT
 #                            SODIUM    START/END     START/END    START/END         START/END            HUMID

 1    1.15   0     82.3        29.1     1314/1405     16.2/ 8.1      10/11     32.8& 5.6/32.8& 6.7       65/59
 2    1.07   0     80.0        26.1     1317/1408     16.2/ 8.1      10/11     32.8& 5.6/32.8& 6.7       65/59
 3    1.16   0    246.5        87.9     1140/1428     18.5/18.1      10/12     32.2& 5.0/33.3& 6.1       68/62
 4    1.16   0    365.4       129.3     1104/1452     11.8/14.8      10/12     31.1& 4.4/33.3& 6.1       70/62
 5    1.10   0    411.1       138.3     1046/1501     10.0/ 8.3       8/11     31.7& 5.0/33.9& 6.7       68/60
 6    1.07   0    214.3        70.4     1225/1440      8.8/12.7      10/11     31.7& 5.0/33.9& 6.7       68/60



RUN#  15   DATE:  9/17/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR=37.1%

ST    PHI    C    VOLUME       NET        TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF      RELAT
 #                            SODIUM    START/END     START/END    START/END         START/END            HUMID

 1    2.72   0     87.5        72.8     1423/1518     12.1/ 9.1       9/10     32.8& 6.1/31.1& 4.4       62/70
 2    1.71   0     86.3        45.1     1425/1520     12.1/ 9.1       9/10     32.8& 6.1/31.1& 4.4       62/70
 3    1.44   0    176.7        78.1     1346/1539     12.5/17.7       8/10     32.2& 4.4/30.6& 5.0       71/67
 4    1.42   0    231.4       100.3     1328/1548     15.4/16.0       9/ 8     31.7& 3.9/30.6& 3.9       74/74
 5    1.70   0    283.8       147.3     1307/1558     10.2/13.9      10/10     32.2& 5.0/30.6& 3.9       68/74
```

```
RUN#  16    DATE:  9/18/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR=45.0%

ST    CHI    C    VOLUME       NET        TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM    START/END     START/END    START/END        START/END             HUMID

 1    3.55   0     60.0        65.1    1307/1345    16.4/13.0       8/ 8       32.2& 5.6/31.1& 4.4      65/70
 2    6.45   0     60.4       119.3    1303/1347    16.4/13.0       8/ 8       32.2& 5.6/31.1& 4.4      65/70
 3    2.73   0    143.9       120.3    1232/1407     9.6/18.3       9/ 8       32.2& 5.6/32.2& 5.0      65/68
 4    3.04   0    199.2       185.3    1213/1418     5.5/15.4       9/ 8       31.7& 5.0/32.8& 5.0      68/68
 5    2.65   0    255.4       207.3    1154/1428     6.1/13.1       8/ 9       31.7& 5.0/32.8& 5.0      66/68
```

```
RUN#  17    DATE:  9/19/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 4.0%

ST    CHI    C    VOLUME       NET        TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM    START/END     START/END    START/END        START/END             HUMID

 1    3.13   0    117.1       112.3    1255/1409    11.1/12.5       8/ 8       32.2& 5.6/32.2& 5.0      65/68
 2    3.26   0    110.4       110.3    1258/1410    11.1/12.5       8/ 8       32.2& 5.6/32.2& 5.0      65/68
 3    2.42   0    279.8       207.3    1215/1518     5.8/20.6       8/ 8       32.2& 7.2/32.2& 4.4      56/71
 4    1.80   0    334.6       184.3    1154/1528    10.3/22.3       8/ 7       31.7& 7.2/32.2& 5.0      55/68
 5    2.05   0    397.5       249.3    1135/1539     9.7/10.4       9/ 9       32.2& 7.2/32.8& 6.1      56/62
 6    1.66   0    492.0       249.3     935/1443     4.3/10.6       9/ 9       30.0& 5.0/32.8& 7.2      67/56
```

```
RUN#  18   DATE:  9/20/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 1.5%

ST    PHI   C   VOLUME      NET      TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                         SODIUM  START/END    START/END   START/END       START/END          HUMID

 1   2.44   0   221.5     165.3   1123/1341     8.5/11.6      4/ 5    31.1& 4.4/31.7& 5.6    70/65
 2   2.40   0   219.5     161.3   1125/1343     8.5/11.6      4/ 5    31.1& 4.4/31.7& 5.6    70/65
 3   2.16   0   245.0     162.3   1035/1320     8.4/13.1      3/ 5    30.0& 3.9/31.7& 5.0    74/68
 4   1.92   0   276.8     162.3   1012/1310     8.0/10.7      3/ 5    30.0& 3.9/31.7& 5.6    74/65
 5   2.01   0   297.6     143.3    953/1256     2.3/ 9.1      3/ 3    31.1& 5.0/32.2& 6.1    67/62




RUN#  19   DATE:  9/20/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 7.6%

ST    PHI   C   VOLUME      NET      TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                         SODIUM  START/END    START/END   START/END       START/END          HUMID

 1   2.30   0    78.5      69.6   1343/1437    11.6/14.9      5/ 5    31.7& 5.6/31.7& 5.6    65/65
 2   3.13   0    78.5      75.3   1350/1439    11.6/14.9      5/ 5    31.7& 5.6/31.7& 5.6    65/65
 3   2.65   0   169.4     137.3   1325/1516    13.1/16.0      5/ 6    31.7& 5.0/31.7& 5.0    68/68
 4   2.30   0   211.7     149.3   1313/1527    10.7/14.6      5/ 5    31.7& 5.6/31.7& 4.4    65/71
 5   2.19   0   260.7     174.3   1250/1537     9.1/17.0      3/ 6    32.2& 6.1/30.6& 3.9    62/74
```

```
RUN#  20   DATE:  9/21/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR= 4.9%

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM    START/END    START/END    START/END        START/END            HUMID

 1    3.26   0    240.9      240.3     1142/1412    14.5/13.5      4/ 5      30.0& 4.4/30.6& 3.9      70/74
 2    3.10   0    241.8      229.3     1144/1413    14.5/13.5      4/ 5      30.0& 4.4/30.6& 3.9      70/74
 3    2.51   0    258.4      198.3     1055/1357    13.2/17.1      3/ 5      30.0& 3.9/31.1& 4.4      74/70
 4    2.07   0    313.5      198.3     1030/1346     8.0/16.0      3/ 4      28.9& 3.3/31.1& 5.0      77/67
 5    2.15   0    342.4      225.3     1009/1336     6.4/ 9.9      3/ 4      28.9& 2.2/31.7& 5.0      84/68
```

```
RUN#  21   DATE:  9/21/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR= 2.7%

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM    START/END    START/END    START/END        START/END            HUMID

 1    3.84   0     93.9      110.3     1419/1517    13.5/17.6      5/ 4      30.6& 3.9/30.0& 4.4      74/70
 2    3.74   0     93.9      107.3     1421/1519    13.5/17.6      5/ 4      30.6& 3.9/30.0& 4.4      74/70
 3    3.54   0    145.0      157.3     1400/1537    17.1/11.8      5/ 4      31.1& 4.4/28.9& 3.3      70/77
 4    2.87   0    182.6      160.3     1351/1548    16.0/ 8.5      4/ 3      31.1& 5.0/29.4& 3.9      67/73
 5    2.63   0    220.5      177.3     1340/1600     9.9/12.6      4/ 4      31.7& 5.0/28.9& 3.9      68/73
```

```
RUN#  22   DATE:  9/24/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 5.7%

ST   PHI    C   VOLUME      NET      TIME       WINDSPEED  WIND DIR.  DRY BULB TEMP & DIFF    RELAT
 #                         SODIUM  START/END   START/END  START/END       START/END           HUMID

 1   4.21   0    60.8      78.3   1333/1411   10.1/ 8.3    10/10    28.3& 2.8/29.4& 2.8      80/81
 2   4.46   0    58.2      79.5   1335/1412   10.1/ 8.3    10/10    28.3& 2.8/29.4& 2.8      80/81
 3   4.18   0   166.1     212.5   1245/1440   14.6/10.3    10/10    28.9& 1.7/28.9& 2.8      88/81
 4   4.01   0   231.1     283.5   1223/1449   15.4/11.9     8/10    28.3& 1.7/28.9& 2.8      88/81
 5   3.58   0   319.5     350.5   1138/1455    7.9/10.0    11/16    28.3& 2.8/28.3& 1.7      80/88
 6   2.56   0   343.2     268.5   1044/1428   10.9/10.2     9/10    28.3& 2.2/30.6& 3.9      84/74




RUN#  23   DATE:  9/25/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 2.1%

ST   PHI    C   VOLUME      NET      TIME       WINDSPEED  WIND DIR.  DRY BULB TEMP & DIFF    RELAT
 #                         SODIUM  START/END   START/END  START/END       START/END           HUMID

 1   1.98   0   128.2      77.8   1205/1326    5.9/10.1     9/ 9    30.6& 3.9/31.1& 3.9      74/74
 2   1.94   0   128.9      76.6   1207/1328    5.9/10.1     9/ 9    30.6& 3.9/31.1& 3.9      74/74
 3   2.33   0   188.3     134.5   1137/1346   11.0/12.7    12/10    31.1& 3.9/31.7& 5.0      74/68
 4   2.41   0   243.5     179.5   1123/1355   13.9/11.7    10/ 9    30.6& 3.3/31.7& 3.9      77/74
 5   1.12   3   278.3      95.5   1103/1403   10.8/ 6.9    11/10    28.9& 2.8/31.1& 4.4      81/70
```

```
RUN#  24    DATE:  9/26/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 2.0%

ST    PHI    C    VOLUME      NET       TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF     RELAT
#                            SODIUM   START/END    START/END   START/END         START/END           HUMID

 1    3.43   0    113.5      119.3    1224/1335    11.9/11.2     6/ 7     31.1& 3.3/32.2& 3.9     77/75
 2    3.50   0    113.2      121.3    1226/1337    11.9/11.2     6/ 7     31.1& 3.3/32.2& 3.9     77/75
 3    3.91   0    228.5      273.3    1126/1358    17.3/13.4     7/ 7     31.1& 2.8/30.6& 3.3     81/77
 4    4.21   0    373.9      481.3    1015/1410    15.5/13.7     5/ 6     30.0& 2.9/32.2& 3.3     81/78
 5    4.41   0    441.4      596.3     950/1422    12.3/17.0     7/ 7     30.0& 2.8/31.7& 3.3     81/78
 6    4.06   0    390.6      485.3    1045/1455    13.5/14.8     6/ 7     30.0& 2.8/31.1& 3.9     81/74


RUN#  25    DATE:  9/27/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR=28.0%

ST    PHI    C    VOLUME      NET       TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF     RELAT
#                            SODIUM   START/END    START/END   START/END         START/END           HUMID

 1    5.34   0    134.2      219.3    1303/1420    27.6/21.9     5/ 5     29.4& 2.8/28.9& 2.8     81/81
 2    3.85   0    130.2      153.3    1305/1421    27.6/21.9     5/ 5     29.4& 2.8/28.9& 2.8     81/81
 3    9.29   0    257.1      731.3    1223/1507    23.0/20.4     4/ 5     29.4& 2.8/27.8& 2.2     81/83
 4    5.64   1     35.7       61.6    1119/1141    17.1/         4/ 5     30.6& 3.9/              74/
 5    3.89   1     87.5      104.3    1051/1144    12.3/         5/ 5     30.6& 3.3/              77/
 6    5.36   1    401.2      658.3    1012/1431     9.5/16.0     5/ 5     30.0& 3.3/29.4& 2.8     77/81
```

```
RUN#  26    DATE:  9/27/73    COOLING DEVICE CODE=0

ST    PHI    C    VOLUME        NET        TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                             SODIUM    START/END     START/END    START/END         START/END           HUMID

 4    7.49   0    300.5        689.3    1208/1516     17.9/15.9       3/ 4     30.6& 3.3/28.3& 3.3      77/76
 5    6.91   0    357.5        756.3    1158/1532     14.9/20.0       5/ 5     31.1& 3.3/28.9& 3.3      77/77



RUN#  27    DATE:  9/26/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 3.3%

ST    PHI    C    VOLUME        NET        TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                             SODIUM    START/END     START/END    START/END         START/END           HUMID

 1   11.57   0     61.1        216.3    1205/1243     20.0/21.2       4/ 4     29.4& 4.4/29.4& 3.9      70/73
 2   11.97   0     61.2        224.3    1207/1245     20.0/21.2       4/ 4     29.4& 4.4/29.4& 3.9      70/73
 3   12.18   0    194.9        726.3    1113/1321     17.9/16.3       4/ 5     30.0& 4.4/30.6& 4.4      70/70
 4   11.57   0    253.5        898.3    1048/1330     14.9/17.0       4/ 4     30.0& 4.4/30.6& 4.4      70/70
 5   12.76   0    319.0       1246.3    1028/1338     18.3/16.1       4/ 4     30.0& 3.9/31.1& 5.6      74/64
 6   10.67   0    286.0        934.3     957/1259     15.9/18.7       4/ 4     29.4& 3.9/30.6& 5.0      73/67
```

```
RUN#  28    DATE: 10/ 1/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 0.4%

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF      RELAT
 #                           SODIUM    START/END    START/END    START/END         START/END             HUMID

 1    5.58   0      72.2     123.3     1134/1220    18.2/15.3      6/ 7      29.4& 3.9/31.7& 6.7       73/58
 2    5.60   0      68.4     117.3     1136/1221    18.2/15.3      6/ 7      29.4& 3.9/31.7& 6.7       73/58
 3    7.19   0     170.1     374.3     1052/1246    14.0/14.5      6/ 6      30.0& 4.4/30.0& 3.9       70/74
 4    6.19   0     221.8     420.3     1035/1258     9.7/16.4      5/ 6      30.0& 5.0/30.6& 3.9       67/74
 5    6.18   0     287.6     544.3     1014/1309    13.4/18.9      5/ 6      30.0& 3.3/31.1& 4.4       77/70



RUN#  29    DATE: 10/ 1/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 4.2%

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF      RELAT
 #                           SODIUM    START/END    START/END    START/END         START/END             HUMID

 1    6.71   0     105.7     217.3     1226/1331    15.3/25.6      7/ 6      31.7& 6.7/29.4& 4.4       58/70
 2    6.43   0     101.8     200.3     1228/1333    15.3/25.6      7/ 6      31.7& 6.7/29.4& 4.4       58/70
 3    8.78   0     127.3     342.3     1251/1415    14.5/12.1      6/ 6      30.0& 3.9/31.1& 5.0       74/67
 4    7.89   0     127.2     307.3     1303/1424    16.4/17.1      6/ 5      30.6& 3.9/30.0& 3.9       74/74
 5    8.31   0     130.6     332.3     1314/1432    18.9/16.3      6/ 6      31.1& 4.4/30.6& 3.9       70/74
```

```
RUN#  30   DATE: 10/ 2/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 2.1%

ST   PHI   C   VOLUME     NET       TIME        WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM   START/END     START/END   START/END        START/END           HUMID

 1   5.96  0   108.8     198.3    1226/1332     23.8/16.4      5/ 5     29.4& 5.0/29.4& 3.9      66/73
 2   5.83  0   104.4     186.3    1229/1334     23.8/16.4      5/ 5     29.4& 5.0/29.4& 3.9      66/73
 3   5.90  0   125.8     227.3    1148/1312     14.0/19.4      5/ 5     30.6& 5.6/30.6& 5.0      64/67
 4   5.24  0   146.8     235.3    1129/1303     15.9/13.1      5/ 4     30.6& 5.0/31.1& 5.6      67/64
 5   4.91  0   162.6     244.3    1113/1251     18.5/15.1      5/ 5     30.6& 5.0/31.7& 6.1      67/61




RUN#  31   DATE: 10/ 2/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 1.6%

ST   PHI   C   VOLUME     NET       TIME        WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM   START/END     START/END   START/END        START/END           HUMID

 1   6.55  0    61.0     122.3    1332/1416     16.4/15.9      5/ 5     29.4& 3.9/29.4& 3.9      73/73
 2   6.45  0    58.4     115.3    1341/1418     16.4/15.9      5/ 5     29.4& 3.9/29.4& 3.9      73/73
 3   6.37  0   125.7     245.3    1316/1438     19.4/11.9      5/ 4     30.6& 5.0/31.1& 5.6      67/64
 4   5.93  0   158.2     282.3    1306/1447     13.1/12.7      4/ 5     31.1& 5.6/30.6& 5.0      64/67
 5   5.76  0   199.8     352.3    1255/1456     15.1/15.7      5/ 4     31.7& 6.1/31.1& 5.6      61/64
```

```
RUN#  32    DATE: 10/ 3/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 1.2%

ST   PHI    C    VOLUME      NET       TIME        WINDSPEED    WIND DIR.     DRY BULB TEMP & DIFF      RELAT
 #                          SODIUM   START/END     START/END    START/END          START/END            HUMID

 1   2.70   0    139.8      115.3    1221/1350     11.3/11.6       5/ 4     27.8& 2.8/27.8& 3.3       80/76
 2   2.73   0    137.0      114.3    1224/1352     11.3/11.6       5/ 4     27.8& 2.8/27.8& 3.3       80/76
 3   0.82   2    193.2       48.5    1123/1329     10.9/11.0       4/ 4     29.4& 4.4/28.9& 4.4       70/69
 4   0.45   2    209.5       29.0    1100/1317     12.0/ 8.3       3/ 4     29.4& 3.9/27.2& 2.2       73/83
 5   0.27   2    231.2       19.0    1043/1304      9.4/ 6.1       3/ 2     30.0& 3.9/27.2& 2.2       74/83



RUN#  33    DATE: 10/ 3/73    COOLING DEVICE CODE=0

ST   PHI    C    VOLUME      NET       TIME        WINDSPEED    WIND DIR.     DRY BULB TEMP & DIFF      RELAT
 #                          SODIUM   START/END     START/END    START/END          START/END            HUMID

 3   2.76   0     74.7       63.0    1333/1423     11.0/12.2       4/ 5     28.9& 4.4/28.3& 3.3       69/76
 4   2.45   0    116.2       87.2    1321/1436      8.3/ 7.6       4/ 3     27.2& 2.2/28.3& 3.3       83/76
 5   2.36   0    162.1      117.3    1310/1447      6.1/ 9.2       2/ 4     27.2& 2.2/29.4& 4.4       83/70
```

```
RUN#  34   DATE: 10/ 8/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 4.3%

ST   PHI   C   VOLUME      NET      TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM   START/END   START/END   START/END       START/END           HUMID

 1   2.31  0   116.4      82.2   1546/1658   14.1/13.7       7/ 6     28.0& 3.5/28.0& 3.0     75/78
 2   2.41  0   108.0      79.7   1551/1700   14.1/13.7       7/ 6     28.0& 3.5/28.0& 3.0     75/78
 3   2.19  0    89.2      59.7   1340/1437   17.3/11.2       8/ 7     30.0& 4.0/28.6& 3.4     73/76
 4   2.13  0   120.5      78.5   1313/1429   16.7/18.4       6/ 5     30.0& 4.0/29.0& 3.3     73/77
 5   1.30  0   292.4     116.3   1125/1421   16.1/16.9       7/ 6     30.0& 2.8/29.0& 3.0     81/79
 6   2.01  0   145.7      89.7   1234/1408   13.0/           5/ 6     31.1& 4.4/     &        71/



RUN#  35   DATE: 10/ 9/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 3.7%

ST   PHI   C   VOLUME      NET      TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM   START/END   START/END   START/END       START/END           HUMID

 1   1.66  0    89.7      45.5   1414/1511   10.5/ 8.2       5/ 5     28.0& 3.7/28.4& 3.4     74/76
 2   1.72  0    87.4      46.0   1416/1513   10.5/ 8.2       5/ 5     28.0& 3.7/28.4& 3.4     74/76
 3   3.48  0   200.3     213.3   1318/1533   20.8/ 9.6       7/ 5     29.2& 3.6/29.8& 4.0     75/73
 4   2.92  0   267.1     230.3   1255/1543   11.5/10.8       4/ 5     29.8& 3.6/29.8& 4.2     75/72
 5   2.80  0   323.3     277.3   1235/1553   10.9/ 9.8       5/ 5     30.5& 3.9/30.0& 3.8     74/74
 6   3.23  1   280.5     277.3   1134/1434   13.3/ 6.9       2/ 6     28.6& 3.3/29.5& 4.5     77/69
```

```
RUN#  36   DATE: 10/10/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR= 4.1%

ST    PHI    C    VOLUME       NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM    START/END    START/END    START/END        START/END            HUMID

 1    3.01   9    128.4       118.5    1403/1522    15.8/19.7       4/ 4      28.0& 4.4/28.8& 4.8      70/67
 2    2.89   9    129.4       114.5    1405/1525    15.8/19.7       4/ 4      28.0& 4.4/28.8& 4.8      70/67
 3    3.26   0    238.7       238.5    1314/1545    17.5/20.6       5/ 4      29.2& 4.0/28.2& 4.2      72/71
 4    2.80   0    299.2       256.5    1245/1556     9.4/11.0       3/ 3      30.0& 5.0/29.2& 5.0      67/66
 5    3.01   0    376.4       346.5    1222/1605    11.4/17.6       3/ 3      30.0& 4.8/28.0& 4.0      68/72
 6    2.37   0    273.2       198.5    1144/1437    10.7/12.6       3/ 3      30.0& 6.0/27.5& 4.0      61/72
```

```
RUN#  37   DATE: 10/11/73   COOLING DEVICE CODE=0

ST    PHI    C    VOLUME       NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM    START/END    START/END    START/END        START/END            HUMID

 3  23.72   5     62.3       452.3    1412/1447    28.4/           4/        28.5& 4.7/     &         68/
 6  12.09   0    147.1       544.3    1255/1434    20.0/18.8       5/ 3      25.2& 2.0/29.5& 5.9      84/61
```

Station 3 was caught in light rain. Heavy winds before a storm may have contaminated the sample. Station 6 was started shortly after a heavy rain.

```
RUN#  38   DATE: 10/12/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 6.8%

ST   PHI    C   VOLUME      NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                        SODIUM   START/END   START/END   START/END        START/END          HUMID

 1  18.57   9   163.0     926.5   1340/1513   32.4/34.9     5/ 5     26.2& 4.2/27.8& 6.1    70/59
 2  17.30   9   151.4     801.5   1349/1516   32.4/34.9     5/ 5     26.2& 4.2/27.8& 6.1    70/59
 3  15.57   0   290.0    1381.5   1246/1544   23.4/23.1     4/ 4     28.6& 5.1/27.5& 5.3    65/63
 4  16.50   0   338.8    1711.5   1222/1556   16.5/21.9     3/ 3     28.5& 5.5/27.7& 5.4    63/63
 5  17.31   0   411.7    2181.5   1200/1605   20.4/19.5     3/ 3     28.0& 5.4/28.2& 5.5    64/63
 6  16.05   0   277.2    1361.5   1125/1417   19.8/24.8     3/ 4     28.0& 5.9/27.6& 6.0    61/59
```

```
RUN#  39   DATE: 10/15/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 3.2%

ST   PHI    C   VOLUME      NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                        SODIUM   START/END   START/END   START/END        START/END          HUMID

 1   9.27   9    64.9     164.3   1435/1515   17.6/23.5     4/ 5     27.2& 3.9/27.1& 4.6    72/67
 2   8.54   9    63.6     166.3   1438/1517   17.6/23.5     4/ 5     27.2& 3.9/27.1& 4.6    72/67
 3   8.47   0   195.4     506.5   1335/1535   17.1/15.2     5/ 6     28.4& 5.4/28.2& 5.6    63/62
 4   7.63   0   245.5     573.5   1309/1545   14.5/19.3     4/ 4     29.0& 6.0/28.0& 5.8    60/61
 5   8.01   0   327.9     803.5   1244/1554   18.3/21.0     4/ 5     28.8& 5.8/28.2& 4.6    61/66
 6   7.25   0   375.4     833.5   1210/1612   14.3/17.3     4/ 5     27.8& 5.8/27.7& 5.2    61/64
```

```
RUN#  40    DATE: 10/16/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 1.5%

ST    PHI    C    VOLUME       NET        TIME        WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM    START/END     START/END   START/END        START/END            HUMID

 1   3.70    0     59.6        71.1     1356/1435     11.5/14.2       5/ 5     28.0& 4.5/27.7& 4.7     69/67
 2   3.96    0     60.1        72.8     1359/1436     11.5/14.2       5/ 5     28.0& 4.5/27.7& 4.7     69/67
 3   4.35    0    166.3       221.5     1312/1500      8.2/10.6       5/ 5     29.0& 6.0/28.3& 5.5     60/63
 4   3.73    0    209.8       239.5     1251/1510     13.0/12.7       5/ 6     28.5& 4.5/28.2& 5.4     69/64
 5   3.92    0    282.8       339.5     1228/1517     12.8/12.0       6/ 5     29.2& 5.2/28.5& 4.9     65/67
 6   3.65    0    352.0       393.5     1150/1535     10.2/13.7       5/ 6     28.2& 5.5/28.0& 5.0     63/66
```

```
RUN#  41    DATE: 10/17/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 0.3%

ST    PHI    C    VOLUME       NET        TIME        WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM    START/END     START/END   START/END        START/END            HUMID

 1   2.85    0     63.3        55.3     1337/1416     11.0/10.3       3/ 3     29.0& 4.8/29.2& 4.5     67/69
 2   2.86    0     59.5        52.1     1339/1417     11.0/10.3       3/ 3     29.0& 4.8/29.2& 4.5     67/69
 3   2.88    0    175.3       154.5     1245/1434     13.2/13.8       3/ 4     28.7& 3.9/28.5& 4.2     73/71
 4   2.57    0    215.4       169.5     1222/1443      9.5/11.4       2/ 3     28.7& 4.3/29.2& 4.6     70/69
 5   2.83    0    276.7       239.5     1207/1452     11.5/11.0       2/ 3     28.6& 4.1/29.0& 4.5     72/69
 6   2.60    0    378.7       301.5     1114/1510     11.3/ 9.0       2/ 3     28.0& 4.2/29.0& 5.0     71/66
```

```
RUN#  42    DATE: 10/18/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 8.6%

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.     DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM    START/END    START/END    START/END          START/END           HUMID

 1    9.66   0     60.6      179.3    1153/1229    14.6/18.2       4/ 4      27.0C 2.2/28.0C 3.1      84/78
 2    8.83   0     60.0      162.3    1155/1231    14.6/18.2       4/ 4      27.0C 2.2/28.0C 3.1      84/78
 3    8.15   0    317.9      793.5    1100/1415    24.3/20.5       4/ 4      27.8C 3.3/29.0C 4.0      76/72
 4    6.86   0    330.1      693.5    1040/1423    20.4/14.1       3/ 4      28.2C 3.7/29.0C 4.0      74/72
 5    6.07   0    430.5      799.5    1020/1432    14.8/15.3       4/ 4      28.8C 3.8/29.5C 4.0      74/73
 6    4.45   0    523.8      713.5     925/1449    17.3/14.3       4/ 4      28.0C 4.5/29.0C 4.0      69/72
```

```
RUN#  43    DATE: 10/18/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 0.3%

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.     DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM    START/END    START/END    START/END          START/END           HUMID

 1   10.46   0    111.0      355.3    1238/1343    18.2/22.7       3/ 3      28.0C 3.1/28.0C 3.2      78/77
 2   10.43   0    109.4      349.3    1240/1345    18.2/22.7       3/ 3      28.0C 3.1/28.0C 3.2      78/77
```

```
RUN#  46    DATE: 10/22/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR=41.1%

ST    DUT     C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM    START/END     START/END    START/END         START/END            HUMID

 1  17.33   2    167.6      832.3    1325/1500     19.0/           2/ 2     27.3C 1.3/     C          96/
 2  10.25   2    161.7      507.3    1324/1501     19.0/           2/ 2     27.3C 1.8/     C          86/
 3   6.49   2    297.5      590.5    1220/1515     35.2/           2/ 2     28.0C 2.5/     C          82/
 4   7.60   2    284.9      662.5    1210/1523     18.3/           2/       29.0C 3.2/     C          78/
 5   5.39   2    348.4      542.5    1205/1529     17.7/           2/ 2     28.8C 3.2/     C          78/
 6   5.04   2    555.6      857.5    1003/1547     14.5/21.9       2/ 2     28.4C 3.4/28.8C 3.3     76/77
```

```
RUN#  45    DATE: 10/23/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 4.4%

ST    DUT     C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM    START/END     START/END    START/END         START/END            HUMID

 1  15.77   9    110.3      532.5    1250/1353     19.3/18.4       2/ 2     28.0C 3.2/27.8C 2.8     77/80
 2  16.49   9    105.1      530.5    1253/1355     19.3/18.4       2/ 2     28.0C 3.2/27.8C 2.8     77/80
 3  16.86   0    203.0     1047.5    1220/1415     32.5/26.1       2/ 2     26.2C 1.7/28.0C 3.7     87/74
 4  14.15   1    219.5      950.5    1156/1423     16.6/17.6       1/ 2     29.0C 3.4/26.7C 4.2     76/71
 5  13.13   1    296.3     1150.5    1144/1431     15.4/15.9       1/ 2     26.5C 2.5/28.0C 3.2     81/77
 6   7.78   2    462.2     1100.5    1004/1446     11.3/14.8      16/ 2     26.0C 2.2/28.8C 4.0     84/72
```

```
RUN#  46   DATE: 10/24/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR= 0.8%

ST   PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                          SODIUM    START/END    START/END    START/END        START/END           HUMID

 1  11.79   3    147.6      532.5    1205/1336    13.0/ 9.8      16/16     27.0& 4.0/27.2& 5.2      71/64
 2  11.70   0    145.9      522.5    1209/1338    13.0/ 9.8      16/16     27.0& 4.0/27.2& 5.2      71/64
 3  11.52   0    281.4      992.5    1113/1405    17.2/11.4      16/ 1     26.2& 3.7/27.2& 4.6      73/67
 4   9.89   0    282.6      655.5    1053/1413    14.4/10.9      15/16     26.0& 3.7/28.0& 5.2      73/65
 5  10.21   0    374.7     1170.5    1037/1421    10.7/ 7.6      16/15     25.3& 2.9/28.5& 5.7      78/62
 6   9.79   0    438.8     1315.5    1007/1438    13.9/12.6      16/16     24.8& 2.5/28.4& 6.9      80/55


RUN#  47   DATE: 10/25/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR= 2.3%

ST   PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                          SODIUM    START/END    START/END    START/END        START/END           HUMID

 1   8.57   3    157.2      412.5    1235/1411    15.4/10.0      16/16     26.2& 5.0/27.7& 5.7      64/61
 2   8.37   3    160.9      412.5    1237/1417    15.4/10.0      16/16     26.2& 5.0/27.7& 5.7      64/61
 3   9.12   0    205.1      572.5    1145/1353    14.4/16.4      16/16     26.0& 4.7/27.6& 5.8      66/61
 4   5.38   0    218.7      400.5    1113/1342    12.4/13.2      16/16     26.3& 4.6/27.5& 5.7      67/61
 5   8.30   4    262.3      666.5    1055/1330    11.7/ 9.8      15/16     25.0& 4.0/27.4& 5.4      70/63
 6   8.31   0    272.2      692.5    1021/1310    12.3/ 8.2      16/16     24.5& 4.5/27.6& 5.6      66/62
```

```
RUN#  49    DATE: 10/25/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 4.9%

ST    PHI    C    VOLUME      NET        TIME        WINDSPEED    WIND DIR.     DRY BULB TEMP & DIFF      RELAT
 #                          SODIUM    START/END     START/END    START/END        START/END              HUMID

 1    6.13   0    215.5      404.5    1415/1625     10.0/ 8.8      16/16      27.7C 5.7/27.0C 5.5       61/61
 2    5.83   0    203.0      362.5    1421/1627     10.0/ 8.8      16/16      27.7C 5.7/27.0C 5.5       61/61
 3   13.19   0    266.9     1077.5    1357/1645     16.4/ 9.0      16/16      27.6C 5.8/27.8C 6.3       61/58
 4   -0.05   0    263.4       -4.0    1345/1652     13.2/11.4      16/16      27.5C 5.7/27.5C 6.5       61/56
 5    5.47   4    352.4      590.5    1335/1704      9.8/10.4      16/16      27.4C 5.4/27.4C 6.8       63/54
 6    6.53   0    142.0      282.5    1313/1440      8.2/ 9.2      16/16      27.6C 5.6/28.0C 6.0       62/60


RUN#  49    DATE: 10/26/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 0.3%

ST    PHI    C    VOLUME      NET        TIME        WINDSPEED    WIND DIR.     DRY BULB TEMP & DIFF      RELAT
 #                          SODIUM    START/END     START/END    START/END        START/END              HUMID

 1   10.47   0    338.7     1085.5    1303/1628     14.0/11.1       2/ 4      26.8C 3.3/26.8C 4.8       76/66
 2   10.53   0    329.9     1060.5    1305/1630     14.0/11.1       2/ 4      26.8C 3.3/26.8C 4.8       76/66
 3   13.71   0    186.0      780.5    1235/1433     19.9/18.8       2/ 3      27.3C 3.8/27.7C 4.7       73/67
 4   11.80   0    216.6      782.5    1213/1448      9.2/14.0       2/ 3      28.0C 4.8/27.0C 5.0       67/65
 5   11.55   3    295.7     1045.5    1206/1504     13.0/13.2       2/ 3      27.0C 4.0/28.1C 5.4       71/64
 6    9.61   0    415.1     1220.5    1145/1600      9.1/10.4       2/ 3      27.3C 4.3/27.5C 5.3       69/63
```

```
RUN#  51   DATE: 10/29/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR= 1.2%

ST    PHI   C   VOLUME      NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                         SODIUM   START/END    START/END   START/END        START/END          HUMID

 1    1.70  0   139.5       72.7    1206/1335    10.4/23.8     14/15     28.5& 6.2/27.5& 4.8     59/66
 2    1.72  0   137.8       72.7    1208/1336    10.4/23.8     14/15     28.5& 6.2/27.5& 4.8     59/66
 3    1.27  3   256.0       99.5    1107/1354    13.1/10.7     15/16     27.8& 5.6/28.2& 5.0     62/66
 4    1.30  3   365.4      145.5    1057/1519    16.9/ 6.4     14/15     27.8& 6.4/28.5& 5.7     57/62
 5    1.43  3   458.2      200.5    1047/1528    15.6/ 7.4     14/16     27.7& 5.7/28.3& 5.5     61/63
 6    1.36  3   555.2      231.5     951/1545    20.3/14.1     15/15     26.1& 4.3/28.2& 5.7     69/62
```

```
RUN#  51   DATE: 10/30/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR=18.6%

ST    PHI   C   VOLUME      NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                         SODIUM   START/END    START/END   START/END        START/END          HUMID

 1    3.83  3   198.3      232.5    1255/1503    16.5/ 9.1     16/16     23.0& 5.8/24.2& 6.2     57/54
 2    4.71  3   194.8      280.5    1259/1504    16.5/ 9.1     16/16     23.0& 5.8/24.2& 6.2     57/54
 3    5.23  3   293.4      477.5    1205/1524    14.8/12.4     15/16     23.7& 6.2/24.0& 6.5     54/52
 4    4.57  3   315.0      440.5    1149/1533    10.0/ 8.9     16/15     23.3& 5.8/24.0& 6.7     57/51
 5    3.84  0   451.7      530.5    1103/1543    14.8/ 7.6     16/12     22.5& 5.0/24.3& 6.7     61/51
 6    5.00  0   349.7      535.5    1040/1422    15.4/ 5.9     16/16     22.0& 5.4/25.0& 6.5     58/53
```

```
RUN#  52   DATE: 10/31/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 0.3%

ST   PHI   C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                      SODIUM   START/END    START/END   START/END        START/END           HUMID

 1   3.48  3   235.1     250.5   1253/1524     6.0/10.0      5/ 9     24.8& 3.9/26.0& 3.2     70/77
 2   3.49  0   238.0     254.5   1255/1526     6.0/10.0      5/ 9     24.8& 3.9/26.0& 3.2     70/77
 3   3.22  0   169.3     136.5   1210/1413    11.3/15.7      8/10     26.1& 4.1/26.6& 3.7     70/73
 4   3.28  0   296.2     297.5   1109/1424     7.6/17.1      8/ 9     25.8& 4.0/27.0& 3.5     71/74
 5   3.33  0   368.9     375.5   1049/1432     7.3/12.8      8/ 9     25.0& 4.5/27.2& 3.9     67/72
 6   2.86  3   431.0     377.5   1015/1448     1.8/11.8      8/ 9     24.5& 4.8/26.3& 3.3     64/76
```

```
RUN#  53   DATE: 11/ 2/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 1.2%

ST   PHI   C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                      SODIUM   START/END    START/END   START/END        START/END           HUMID

 1   1.63  0   125.7      62.7   1114/1237    10.6/ 6.5      4/ 6     28.2& 2.0/30.8& 3.7     85/75
 2   1.61  0   129.8      64.0   1117/1238    10.6/ 6.5      4/ 6     28.2& 2.0/30.8& 3.7     85/75
 3   1.29  0   294.1     116.5    949/1301    11.5/11.0     11/ 6     28.0& 2.3/29.7& 3.0     83/79
 4   1.39  0   428.0     182.5    835/1330        /15.1      5/ 6     29.0& 3.0/29.9& 3.1     79/79
 5   1.47  0   543.5     244.5    810/1345     2.7/11.1      1/ 8     26.0& 1.0/30.8& 4.0     92/73
```

```
RUN#  54   DATE: 11/ 5/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR= 4.5%

ST   PHI    C   VOLUME      NET      TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF     RELAT
 #                         SODIUM  START/END   START/END   START/END        START/END            HUMID

 1   1.90   0   299.9     174.5   1039/1351    8.6/11.0     6/ 8     28.8& 3.6/29.0& 4.2      75/71
 2   1.99   0   306.0     186.5   1042/1353    8.6/11.0     6/ 8     28.8& 3.6/29.0& 4.2      75/71
 3   2.06   0   444.5     280.5    927/1417    8.2/16.7     6/ 8     28.2& 3.1/28.5& 3.7      78/74
 4   1.85   0   469.2     266.5    900/1424    8.5/ 9.9     6/ 7     27.2& 2.7/29.2& 3.7      80/74
 5   1.96   0   585.6     350.5    838/1431    9.0/13.3     5/ 7     28.3& 3.4/29.2& 4.0      76/72


RUN#  55   DATE: 11/ 6/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR= 1.0%

ST   PHI    C   VOLUME      NET      TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF     RELAT
 #                         SODIUM  START/END   START/END   START/END        START/END            HUMID

 1   1.23   0   296.3     111.5   1150/1457    6.7/11.4     3/ 3     28.2& 3.7/29.0& 5.2      74/65
 2   1.24   0   306.5     116.5   1153/1500    8.7/11.4     3/ 3     28.2& 3.7/29.0& 5.2      74/65
 3   1.14   0   471.6     164.5   1003/1517   13.5/15.5     3/ 4     27.3& 2.8/27.8& 4.3      79/70
 4   0.83   0   469.6     119.5    955/1526    7.3/11.9     2/ 4     27.6& 3.4/28.0& 4.5      76/69
 5   0.75   0   593.2     135.5    944/1536    8.5/11.9     2/ 4     26.7& 3.2/27.5& 3.7      76/73
```

```
RUN#  56    DATE: 11/ 7/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 3.3%

ST    PHI    C    VOLUME       NET        TIME        WINDSPEED     WIND DIR.     DRY BULB TEMP & DIFF      RELAT
 #                            SODIUM    START/END     START/END     START/END          START/END             HUMID

 1   17.86   9    267.3      1461.5    1211/1449     25.2/20.1        4/ 4      26.3& 3.5/26.0& 3.0       74/78
 2   18.46   9    268.3      1516.5    1213/1450     25.2/20.1        4/ 4      26.3& 3.5/26.0& 3.0       74/78
 3   17.53   0    349.8      1876.5    1133/1514     14.1/17.8        5/ 4      28.3& 4.5/26.3& 4.3       69/69
 4   15.46   0    352.2      1666.5    1118/1520     17.4/12.2        5/ 4      27.8& 4.8/26.0& 4.0       67/71
 5   15.81   0    461.6      2233.5    1050/1528     16.3/16.0        5/ 4      27.6& 4.4/26.0& 4.0       69/71



RUN#  57    DATE: 11/ 9/73    COOLING DEVICE CODE=0     PRECISION RUN ERROR= 1.0%

ST    PHI    C    VOLUME       NET        TIME        WINDSPEED     WIND DIR.     DRY BULB TEMP & DIFF      RELAT
 #                            SODIUM    START/END     START/END     START/END          START/END             HUMID

 1    7.90   0    365.5       884.5    1040/1433      5.5/ 7.8        4/ 6      27.8& 4.3/27.0& 4.0       70/71
 2    7.98   0    375.1       916.5    1043/1435      5.5/ 7.8        4/ 6      27.8& 4.3/27.0& 4.0       70/71
 3    9.09   0    463.7      1289.5     947/1454     10.3/ 9.7        4/ 6      27.2& 4.0/28.0& 4.0       71/72
 4    8.38   0    488.1      1251.-     933/1500      8.2/ 8.3        5/ 7      27.5& 3.8/27.2& 4.2       73/70
 5    8.53   0    599.1      1564.5     917/1517     10.7/11.2        5/ 6      26.9& 3.7/27.0& 3.8       73/72
```

```
RUN#  58   DATE: 11/10/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 5.2%

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM    START/END    START/END    START/END        START/END            HUMID

 1    5.40   0    244.7      404.5     1125/1401     7.2/ 9.9       1/ 3     26.8& 3.5/26.8& 3.1      74/77
 2    5.70   0    252.6      440.5     1129/1405     7.2/ 9.9       1/ 3     26.8& 3.5/26.8& 3.1      74/77
 3    5.91   3    306.5      554.5     1105/1423    11.3/14.7       1/ 3     26.8& 4.0/26.7& 3.2      71/76
 4    5.29   0    334.3      541.5     1050/1431    12.6/ 9.2       1/ 3     27.8& 4.6/27.2& 3.7      68/73
 5    5.64   0    391.6      676.5     1036/1438     9.0/10.5       1/ 3     26.0& 3.2/26.8& 3.3      77/76


RUN#  59   DATE: 11/12/73   COOLING DEVICE CODE=0

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM    START/END    START/END    START/END        START/END            HUMID

  3  14.56   1    121.9      543.5     1131/1244    27.1/           3/       24.5& 4.2/      &        68/
  4  12.31   1    141.5      533.5     1110/1240    11.2/           3/       23.6& 4.9/      &        63/
  5   9.54   1    181.0      528.5     1048/1236    14.6/           3/       24.2& 5.2/      &        61/
```

```
RUN#  60   DATE: 11/13/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 2.3%

ST    PHI   C    VOLUME       NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                          SODIUM    START/END     START/END   START/END        START/END          HUMID

 1  10.79   9    280.4      926.5    1208/1455     23.4/19.4       4/ 4     23.8& 3.3/24.0& 3.5     74/73
 2  11.05   9    280.3      948.5    1209/1457     23.4/19.4       4/ 4     23.8& 3.3/24.0& 3.5     74/73
 3  11.39   0    397.9     1386.5    1111/1518     26.0/21.1       4/ 5     25.3& 4.7/24.6& 4.1     66/69
 4   9.83   0    419.4     1261.5    1053/1526     17.1/17.5       4/ 4     26.0& 5.0/24.7& 3.9     64/70
 5  10.16   0    498.7     1551.5    1030/1534     14.2/16.3       4/ 4     25.3& 4.8/25.0& 4.0     65/70
```

```
RUN#  61   DATE: 11/14/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 0.7%

ST    PHI   C    VOLUME       NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                          SODIUM    START/END     START/END   START/END        START/END          HUMID

 1  12.38   0    227.9      863.5    1137/1355     20.5/21.3       5/ 4     24.2& 3.2/24.1& 3.3     75/74
 2  12.30   0    220.1      828.5    1140/1357     20.5/21.3       5/ 4     24.2& 3.2/24.1& 3.3     75/74
 3  12.48   0    298.0     1138.5    1113/1442     14.6/16.2       5/ 5     26.0& 4.5/26.0& 4.9     68/65
 4  10.70   0    320.2     1048.5    1101/1435     13.3/13.7       5/ 5     26.5& 4.7/28.9& 7.9     66/49
 5  11.08   0    397.1     1346.5    1049/1447     14.6/12.9       5/ 4     26.0& 4.8/25.5& 4.9     66/64
```

```
RUN#  62   DATE: 11/15/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 1.8%

ST   PHI   C   VOLUME     NET      TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM  START/END    START/END   START/END       START/END           HUMID

 1   6.75  0   214.6     443.5   1103/1315    10.9/10.4     6/ 6     25.8C 3.1/26.0C 2.8      77/79
 2   6.88  0   206.0     433.5   1107/1317    10.9/10.4     6/ 6     25.8C 3.1/26.0C 2.8      77/79
 3   6.35  0   310.6     793.5   1030/1349    13.9/11.1     6/ 6     26.6C 4.1/26.7C 3.7      70/73
 4   7.36  0   360.2     811.5   1015/1403    14.4/11.9     6/ 6     26.5C 4.2/25.5C 3.0      70/77
 5   7.51  0   421.1     568.5   1003/1415    12.1/13.9     6/ 5     26.8C 4.0/25.5C 3.0      71/77


RUN#  63   DATE: 11/16/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 0.8%

ST   PHI   C   VOLUME     NET      TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM  START/END    START/END   START/END       START/END           HUMID

 1   3.62  0   224.5     248.5   1243/1501    12.7/12.4     5/ 7     25.5C 1.8/25.8C 2.3      86/83
 2   3.59  0   217.2     238.5   1245/1503    12.7/12.4     5/ 7     25.5C 1.8/25.8C 2.3      86/83
 3   5.04  0   381.8     588.5   1110/1517    11.0/12.4     4/ 7     27.0C 4.1/25.3C 2.3      70/82
 4   4.68  0   407.3     583.5   1100/1524     8.8/14.1     5/ 7     26.8C 3.3/25.8C 2.0      76/85
 5   5.38  0   487.5     803.5   1044/1533     6.1/14.3     5/ 7     28.0C 5.0/26.0C 2.9      66/79
```

```
RUN#  64   DATE: 11/20/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 1.7%

ST   PHI   C   VOLUME      NET       TIME        WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                        SODIUM   START/END    START/END   START/END        START/END          HUMID

 1   4.10  0   242.0     303.5   1215/1440    17.8/18.5      6/ 5    27.0& 3.2/26.4& 3.4    76/75
 2   4.17  0   236.3     301.5   1217/1442    17.9/18.5      5/ 5    27.0& 3.2/26.4& 3.4    76/75
 3   5.42  0   249.4     413.5   1144/1421    13.1/15.0      6/ 6    28.0& 3.7/28.0& 3.5    74/75
 4   7.23  0   258.3     571.5   1125/1410    18.2/20.7      6/ 6    28.0& 4.0/27.6& 3.2    72/77
 5   4.03  0   278.2     343.5   1113/1400    17.9/20.2      5/ 5    28.2& 3.7/28.0& 3.0    74/78
 6   3.11  0   233.0     221.5   1043/1309    18.4/14.6      6/ 5    26.3& 3.3/27.8& 3.8    76/73
```

```
RUN#  65   DATE: 11/20/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 2.1%

ST   PHI   C   VOLUME      NET       TIME        WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                        SODIUM   START/END    START/END   START/END        START/END          HUMID

 1   4.25  0   162.4     211.5   1448/1625    18.5/          5/ 6    26.4& 3.4/     &       75/
 2   4.35  0   162.7     216.5   1450/1627    18.5/          5/ 6    26.4& 3.4/     &       75/
 3   5.09  0   159.6     248.5   1425/1603    14.4/17.6      6/ 6    28.0& 3.5/26.6& 3.4    75/75
 4   4.33  0   144.4     191.5   1415/1546    20.7/18.6      6/ 6    27.6& 3.2/27.0& 3.4    77/75
 5   4.44  0   149.8     203.5   1405/1523    20.2/18.3      5/ 6    28.0& 3.0/27.0& 3.0    78/78
 6   1.79  0   175.5      95.5   1323/1511    14.6/13.3      6/ 6    27.8& 3.8/26.7& 3.4    73/75
```

```
RUN#  66   DATE: 11/21/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR=33.2%

ST    PHI    C    VOLUME       NET       TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM   START/END    START/END    START/END         START/END            HUMID

 1    9.71   0    249.4       741.5   1234/1503    17.5/16.7       6/ 6      27.1& 2.1/26.3& 1.8      84/86
 2    6.48   0    248.6       493.5   1236/1505    17.5/16.7       6/ 6      27.1& 2.1/26.3& 1.8      84/86
 3   10.95   0    322.6      1081.5   1208/1528    21.3/17.3       7/ 6      28.0& 2.7/27.0& 2.5      80/81
 4   11.70   0    343.8      1178.5   1156/1538    22.6/16.5       7/ 6      27.8& 2.7/27.1& 2.1      80/84
 5    7.07   0    490.5      1061.5   1109/1553    18.9/           7/ 6      29.0& 3.0/     &         79/
 6    9.12   0    363.2      1013.5   1042/1425    15.3/18.5       6/ 6      28.5& 3.2/27.0& 2.5      77/81



RUN#  67   DATE: 11/27/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR= 3.3%

ST    PHI    C    VOLUME       NET       TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM   START/END    START/END    START/END         START/END            HUMID

 1    9.38   0    159.0       456.5   1402/1538    13.1/14.0       8/ 7      27.5& 3.4/26.0& 2.1      75/84
 2    9.07   0    154.4       428.5   1405/1539    13.1/14.0       7/ 7      27.5& 3.4/26.0& 2.1      75/84
 3   11.17   0    233.5       798.5   1329/1553    16.5/14.9       8/ 8      27.5& 3.3/27.3& 2.5      76/81
 4   10.00   0    257.6       788.5   1313/1600    21.5/15.7       7/ 8      27.4& 2.5/26.7& 2.0      82/85
 5    8.70   0    326.0       868.5   1255/1607    19.7/15.5       8/ 8      28.7& 3.1/27.6& 2.1      78/84
 6    8.49   0    385.3      1001.5   1225/1622    19.2/11.9       8/ 8      27.9& 3.2/26.2& 2.7      77/80
```

```
RUN#  68   DATE: 11/30/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 1.1%

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM    START/END    START/END    START/END          START/END           HUMID

 1  21.21   9    256.7      1666.5    1147/1424    19.0/19.8      3/ 3      23.9& 4.9/22.1& 4.1      63/67
 2  20.97   9    256.5      1646.5    1149/1425    19.0/19.8      3/ 3      23.9& 4.9/22.1& 4.1      63/67
 3  27.96   0    367.0      3141.5    1100/1442    29.3/19.7      3/ 3      23.4& 3.8/22.0& 3.9      70/69
 4  20.10   0    381.8      2348.5    1040/1450    21.0/17.0      3/ 3      23.8& 4.8/22.0& 3.7      63/70
 5  20.99   0    472.0      3016.5    1019/1456    15.0/19.7      3/ 3      23.7& 4.7/22.0& 2.7      64/78
 6  12.74   0    536.2      2091.5     942/1512    10.9/15.0      2/ 3      21.5& 4.4/22.2& 4.1      65/67
```

```
RUN#  69   DATE: 12/ 1/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 8.5%

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM    START/END    START/END    START/END          START/END           HUMID

 1  11.59   0    137.7       488.5    1307/1430    14.9/14.0      3/ 3      23.0& 4.0/23.2& 3.7      69/71
 2  10.60   0    133.6       433.5    1309/1432    14.9/14.0      2/ 3      23.0& 4.0/23.2& 3.7      69/71
 3   7.95   0    416.4      1013.5    1207/1502    19.2/17.7      3/ 3      23.0& 3.5/23.0& 3.5      73/73
 4  10.09   0    308.0       951.5    1144/1510    16.1/12.9      3/ 3      23.0& 3.6/24.0& 4.0      72/69
 5  10.80   0    388.4      1283.5    1126/1517    18.0/13.8      3/ 3      23.2& 4.1/23.7& 4.1      68/68
 6   9.15   0    293.3       821.5    1235/1530    13.8/17.5      3/ 3      24.0& 4.8/22.8& 3.8      63/70
```

```
RUN#  70   DATE: 12/ 4/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 4.8%

ST    PHI    C    VOLUME      NET        TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM    START/END     START/END    START/END         START/END           HUMID

 1   16.53   0    204.2     1033.5    1204/1402     24.1/15.9       6/ 6     24.5C 2.8/24.5C 2.5       78/80
 2   17.37   0    200.6     1066.5    1206/1404     24.1/15.9       6/ 6     24.5C 2.8/24.5C 2.5       78/80
 3   18.91   0    301.8     1746.5    1121/1417     18.3/17.6       6/ 7     26.0C 3.0/26.0C 3.7       78/73
 4   20.08   0    377.6     2321.5    1027/1426     20.1/20.7       6/ 7     26.0C 2.9/26.0C 3.0       79/78
 5    0.96   0    483.3      142.5     956/1436     20.9/21.5       6/ 7     26.0C 3.5/25.7C 3.7       74/73
 6   14.53   0    226.7     1008.5    1234/1450     20.9/20.6       6/ 6     26.2C 3.7/25.6C 3.6       73/73
```

```
RUN#  71   DATE: 12/ 5/73   COOLING DEVICE CODE=0    PRECISION RUN ERROR= 3.6%

ST    PHI    C    VOLUME      NET        TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM    START/END     START/END    START/END         START/END           HUMID

 1    9.58   0    241.0      736.5    1324/1548     11.7/ 9.5       8/10     25.5C 2.6/25.0C 3.0       80/77
 2    9.62   0    238.2      701.5    1325/1549     11.7/ 9.5       8/10     25.5C 2.6/25.0C 3.0       80/77
 3    9.39   0    427.5     1228.5    1115/1531     23.5/15.1      10/10     25.5C 1.8/25.6C 2.8       86/79
 4   11.05   0    337.1     1343.5    1107/1521     22.4/14.4      10/10     25.2C 2.0/25.5C 2.9       84/78
 5   10.23   4    440.1     1376.5    1056/1510     16.0/12.3       8/10     27.0C 3.0/25.5C 3.3       78/75
 6    9.15   0    341.4      956.5    1251/1620      6.3/ 8.8       9/10     27.0C 3.7/25.0C 3.4       73/74
```

```
RUN#  72   DATE: 12/ 6/73   COOLING DEVICE CODE=0     PRECISION RUN ERROR= 3.3%

ST   PHI    C   VOLUME      NET        TIME       WINDSPEED    WIND DIR.     DRY BULB TEMP & DIFF      RELAT
#                          SODIUM    START/END    START/END    START/END          START/END            HUMID

 1    9.57  0    226.9     664.3    1250/1513     8.9/10.7       7/ 7      27.5C 3.0/26.5C 2.8       78/79
 2    9.25  0    229.2     649.3    1252/1514     8.9/10.7       7/ 7      27.5C 3.0/26.5C 2.8       78/79
 3   10.98  0    249.5     838.5    1220/1455    15.8/11.0       8/ 8      28.0C 4.0/27.8C 3.4       72/76
 4   10.99  0    330.4    1111.5    1113/1446    18.1/16.4       8/ 7      27.2C 3.2/27.0C 3.5       77/74
 5   11.02  0    375.6    1266.5    1054/1438    13.3/15.3       8/ 7      28.5C 3.6/27.8C 3.8       75/73
 6    9.12  0    401.5    1121.5    1017/1424    13.9/14.7       7/ 7      27.0C 4.0/27.2C 4.1       71/71
```

Station 2 was dismantled for relocation in order to facilitate upcoming cooling device contribution measurements. Run #72 contains therefore the last precision run.

```
RUN#  73   DATE: 12/11/73   COOLING DEVICE CODE=0

ST   PHI    C   VOLUME      NET        TIME       WINDSPEED    WIND DIR.     DRY BULB TEMP & DIFF      RELAT
#                          SODIUM    START/END    START/END    START/END          START/END            HUMID

 1    4.56  5    350.0     531.5    1107/1432    22.8/12.4      14/15      14.8C 2.9/17.0C 4.7       72/58
 3   11.31  0    139.6     483.5    1051/1456    22.0/11.2      15/15      14.5C 2.5/17.2C 5.2       75/54
 4    2.95  0    502.4     453.5    1024/1530    10.3/ 7.6       1/16      14.6C 2.6/17.2C 5.2       74/54
 5    3.58  0    565.8     619.5    1012/1545    24.0/ 8.2      16/ 1      13.9C 2.3/16.8C 5.0       77/55
 6    3.36  0    609.0     626.5     948/1604    14.3/10.6       1/ 1      13.5C 2.2/17.0C 5.3       77/53
```

Trash fire across the canal directly upwind of Station 1. Possible contamination from heavy smoke.

```
RUN#  74   DATE: 12/13/73   COOLING DEVICE CODE=0

ST   PHI   C   VOLUME     NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM   START/END    START/END   START/END        START/END           HUMID

 1   1.84  0   471.2     265.3    1221/1708    12.1/11.5     14/11     21.0& 5.0/19.5& 4.6     60/61
 3   2.68  3   408.2     335.3    1202/1647    10.9/ 9.2     15/12     20.2& 5.1/21.0& 5.0     58/60
 4   2.54  0   449.6     349.3    1033/1600    10.5/ 8.1     14/11     19.6& 4.7/21.8& 5.3     60/58
 5   2.09  4   549.4     352.3    1105/1630     9.5/ 7.6     14/12     20.8& 4.8/21.2& 5.4     61/57
 6   1.97  3   787.9     475.3     950/1752     9.4/ 3.4     15/12     18.8& 4.8/17.2& 3.0     59/72


RUN#  75   DATE: 12/14/73   COOLING DEVICE CODE=0

ST   PHI   C   VOLUME     NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM   START/END    START/END   START/END        START/END           HUMID

 1   2.92  0   256.2     229.3    1209/1435    14.5/13.9     11/11     24.2& 4.4/24.5& 4.5     66/66
 3   3.39  0   188.4     155.3    1305/1502    23.3/20.6     11/11     24.6& 4.1/23.8& 3.8     69/70
 4   2.88  0   176.1     155.3    1316/1516    19.7/21.4     11/11     25.0& 4.0/23.9& 3.9     70/70
 5   3.09  3   214.1     202.3    1326/1529    20.9/17.5     11/11     23.9& 4.3/23.2& 4.2     67/68
 6   2.71  0   292.4     242.3    1344/1638    15.1/11.7     11/11     25.0& 4.4/23.0& 4.2     67/68
```

```
RUN#  76   DATE: 12/17/73   COOLING DEVICE CODE=0

ST   PHI   C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM   START/END    START/END   START/END        START/END          HUMID

 1   8.87  0   445.3    1209.3    935/1400    12.2/18.2     15/12     12.5C 2.0/16.9C 3.1     79/71
 3   6.71  3   391.9     805.3   1005/1412    11.2/ 8.7     13/15     12.7C 2.2/17.6C 3.5     77/69
 4   7.54  0   358.3     827.3   1024/1420     6.4/10.1     16/15     14.8C 2.8/16.4C 3.4     73/68
 5   7.49  0   361.9     825.3   1044/1427     7.1/14.1     16/15     13.4C 2.4/16.0C 3.0     75/71
 6   7.56  0   351.9     857.3   1108/1443     8.4/14.4     16/15     15.0C 2.5/17.4C 3.6     76/68




RUN#  77   DATE: 12/18/73   COOLING DEVICE CODE=0

ST   PHI   C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM   START/END    START/END   START/END        START/END          HUMID

 1   2.45  0   292.7     219.3   1315/1606     9.4/10.6      2/ 1     15.7C 3.7/16.5C 1.5     65/85
 3   2.56  0   309.9     243.3   1300/1621    20.0/14.1      2/ 1     15.3C 4.0/16.3C 1.3     62/87
 4   2.18  0   322.0     215.3   1251/1628     8.5/ 9.2      3/ 1     17.0C 4.9/16.3C 1.5     56/85
 5   2.00  0   345.3     211.3   1240/1636    10.8/10.3      3/16     15.5C 4.0/16.8C 1.8     62/82
 6   1.77  3   437.3     237.3   1223/1558     6.7/ 7.1      3/ 2     16.3C 4.8/16.5C 1.5     56/85
```

```
RUN#  78   DATE:  1/ 2/74   COOLING DEVICE CODE=0

 ST    PHI   C   VOLUME      NET       TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
  #                        SODIUM   START/END    START/END   START/END        START/END          HUMID

  1  11.25   0   259.9      895.3   1314/1540    22.7/20.7      5/ 5     24.9C 1.9/24.8C 2.0     85/84
  3  10.72   0   329.9     1082.3   1214/1526    25.1/26.0      6/ 6     26.7C 2.7/25.8C 2.8     80/79
  4  10.15   0   317.2      985.3   1156/1519    18.3/21.7      6/ 6     26.7C 2.7/26.1C 3.1     80/77
  5   9.95   0   369.4     1125.3   1142/1511    26.8/23.8      5/ 5     26.8C 2.6/26.5C 2.5     81/81
  6   9.19   0   212.4      597.3   1238/1443    25.6/16.7      6/ 6     26.4C 2.4/26.6C 3.4     82/75


RUN#  79   DATE:  1/ 4/74   COOLING DEVICE CODE=0

 ST    PHI   C   VOLUME      NET       TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
  #                        SODIUM   START/END    START/END   START/END        START/END          HUMID

  1   8.02   0   177.3      435.3   1258/1443    10.5/11.0      7/ 7     25.5C 2.0/26.0C 2.5     84/81
  3   8.18   0   304.6      762.3   1151/1456    20.2/16.1      7/ 8     26.2C 2.2/26.2C 2.7     84/80
  4   8.10   0   315.6      782.3   1133/1505    16.4/18.9      6/ 7     27.0C 2.8/25.5C 2.3     79/82
  5   7.96   0   405.9      989.3   1120/1512    15.3/18.8      7/ 7     27.0C 3.0/25.0C 2.4     78/81
  6   7.00   0   304.2      652.3   1219/1529    20.2/14.3      7/ 7     26.0C 2.5/25.3C 2.7     81/79
```

```
RUN# 80   DATE:  1/ 8/74   COOLING DEVICE CODE=0

ST    PHI    C    VOLUME       NET        TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF      RELAT
 #                            SODIUM    START/END     START/END    START/END         START/END            HUMID

 1    2.69   0    251.8      207.3     1343/1617      7.9/ 8.2      6/ 6      25.4& 2.4/26.7& 3.2       81/76
 3    3.08   0    257.0      242.3     1320/1600      7.2/14.0      7/ 6      26.0& 2.8/26.5& 3.4       79/75
 4    2.75   0    253.5      213.3     1300/1549      7.9/12.4      6/ 6      26.5& 2.5/26.2& 3.2       81/77
 5    3.80   0    220.6      256.3     1252/1538     12.1/10.3      6/ 6      27.0& 3.0/27.3& 3.3       78/76
 6    2.76   0    353.7      298.3     1137/1515      7.8/10.4      7/ 7      25.4& 2.6/26.9& 3.4       80/75


RUN# 81   DATE:  1/ 9/74   COOLING DEVICE CODE=0

ST    PHI    C    VOLUME       NET        TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF      RELAT
 #                            SODIUM    START/END     START/END    START/END         START/END            HUMID

 1    6.94   0    241.1      512.3     1342/1604     17.5/14.9      6/ 6      25.6& 3.6/25.5& 3.5       73/74
 3    6.69   0    238.0      487.3     1256/1520     12.5/14.3      7/ 7      26.7& 3.7/25.8& 3.3       73/76
 4    6.97   0    322.3      687.3     1145/1509     22.6/17.8      6/ 6      26.2& 3.1/26.7& 3.7       77/73
 5    7.09   0    361.7      785.3     1130/1456     17.0/18.2      6/ 5      26.5& 3.6/27.0& 3.5       74/74
 6    6.40   0    229.2      449.3     1320/1539     14.9/20.2      7/ 5      27.0& 4.0/26.1& 4.1       71/70
```

```
RUN#  82   CATE:  1/11/74   COOLING DEVICE CODE=0

 ST   PHI   C   VOLUME     NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
  #                       SCDIUM   START/END    START/END   START/END       START/END           HUMID

  1   7.74  0   429.1    1017.3   1137/1550    15.2/12.2      6/ 7     24.6C 2.6/26.0C 2.1     80/84
  3   8.86  0   428.7    1162.3   1121/1533    15.6/19.9      7/ 7     25.9C 3.8/26.9C 3.7     72/73
  4   9.47  0   396.4    1027.3   1110/1522    19.3/17.2      7/ 7     26.0C 3.0/25.7C 2.7     78/80
  5   8.45  0   427.5    1105.3   1058/1511    14.0/17.2      7/ 6     26.5C 3.5/27.0C 3.9     74/72
  6   6.64  0   382.6     777.3   1035/1441    14.2/16.9      7/ 7     24.9C 3.4/26.0C 4.0     74/71


RUN#  83   DATE:  1/31/74   COOLING DEVICE CODE=2

 ST   PHI   C   VOLUME     NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
  #                       SCDIUM   START/END    START/END   START/END       START/END           HUMID

  3   5.48  0   736.2    1234.3    910/1723     5.5/13.6      1/ 6     21.8C 1.0/26.1C 4.1     91/70
  4  11.29  0   459.2    1587.3    938/1427     4.2/ 8.6      3/ 6     23.5C 2.0/26.8C 3.9     84/72
  5   7.06  0   342.2     735.3   1017/1433     3.8/12.6     15/ 5     24.0C 2.0/26.8C 3.8     84/72
  6   4.69  0   277.0     397.3   1225/1522     8.3/18.7      9/ 5     27.2C 4.9/26.8C 4.3     65/69
  7   5.55  0   454.3     772.3    958/1443     2.9/10.7      3/ 6     23.2C 1.7/26.6C 4.4     86/68
  8   4.81  0   473.9     697.3   1035/1605     4.0/13.1      3/ 5     25.0C 2.5/26.4C 3.4     80/75
  9   4.31  0   282.1     372.3   1208/1507     8.6/ 6.8      5/ 5     27.5C 4.5/27.0C 4.3     68/69
 10   3.67. 0   220.3     247.3   1240/1534     6.5/15.8      5/ 6     27.6C 4.8/26.9C 4.5     67/68
```

```
RUN#  84   DATE:  2/ 1/74   COOLING DEVICE CODE=2

ST    PHI    C    VOLUME      NET        TIME        WINDSPEED     WIND DIR.    DRY BULB TEMP & DIFF        RELAT
 #                           SODIUM    START/END     START/END     START/END         START/END              HUMID

 3    2.59   0    470.0      372.3    1009/1635      6.4/ 7.2        2/ 7     25.0C 4.7/26.0C 4.0         65/71
 4    5.57   0    280.8      822.3    1231/1534      4.9/ 9.2        5/ 6     26.8C 4.9/26.4C 4.4         65/68
 5    5.38   0    291.1      479.3    1252/1554     10.3/ 9.6        6/ 5     26.3C 4.2/26.3C 4.4         70/68
 6    4.01   0    268.1      329.3    1415/1700      8.5/10.7        6/ 6     26.7C 4.5/25.9C 4.0         68/71
 7    3.71   0    289.6      329.3    1238/1539      8.5/11.2        5/ 5     26.1C 4.8/26.4C 4.4         66/68
 8    3.47   0    267.5      284.3    1305/1609     11.6/ 7.4        6/ 6     25.6C 3.4/26.0C 3.9         75/72
 9    3.00   0    296.3      272.3    1357/1710      8.6/ 9.1        4/ 5     27.4C 5.2/26.1C 4.0         64/71
10    2.41   5     58.5       43.1    1427/1645     11.1/ 9.7        3/ 5     26.6C 4.7/26.3C 4.8         66/66
11   14.16   0    299.2     1297.3    1155/1505     12.1/10.3        5/ 5     25.9C 4.0/25.8C 4.0         71/71

Low RPM on Station 10.


RUN#  85   DATE:  2/ 2/74   COOLING DEVICE CODE=2

ST    PHI    C    VOLUME      NET        TIME        WINDSPEED     WIND DIR.    DRY BULB TEMP & DIFF        RELAT
 #                           SODIUM    START/END     START/END     START/END         START/END              HUMID

 3    2.99   0    279.6      256.3    1055/1320     19.4/18.7        8/ 8     25.5C 5.2/26.2C 5.1         62/64
 4    3.20   0    220.7      216.3    1105/1326     17.5/17.8        8/ 8     26.0C 4.5/27.0C 4.8         68/66
 5    4.17   0    257.8      329.3    1116/1350     18.7/14.2        8/ 8     26.1C 5.3/26.0C 4.5         62/68
 7   19.14   0    198.4     1162.3    1140/1344     14.8/19.3        7/ 7     26.0C 5.5/26.8C 5.0         61/64
```

```
RUN#  86   DATE:  2/ 6/74   COOLING DEVICE CODE=0

ST   PHI    C   VOLUME    NET       TIME        WINDSPEED    WIND DIR.   DRY BULB TEMP & DIFF    RELAT
#                         SODIUM    START/END   START/END    START/END        START/END          HUMID

 3  24.55   0   323.7     2472.3    1111/1509   22.5/28.4      7/ 7     22.5& 3.5/25.0& 4.0     72/70
 4  20.59   0   396.2     2497.3    1127/1524   28.8/24.2      7/ 7     24.0& 3.4/25.0& 3.7     73/72
 5  22.26   0   307.8     2097.3    1151/1544   25.7/24.0      7/ 7     24.2& 3.6/24.8& 4.3     72/68
 6  18.21   0   313.5     1747.3    1329/1657   20.9/16.9      7/ 6     24.4& 4.1/25.0& 4.3     69/68
 7  19.17   0   393.6     2309.3    1137/1534   24.0/26.2      7/ 6     22.8& 4.1/24.9& 4.8     68/65
 8  20.57   0   317.4     1998.3    1239/1557   24.2/24.5      7/ 7     23.5& 3.5/24.4& 3.9     73/70
 9  16.54   0   303.0     1534.3    1314/1624   14.5/15.9      6/ 6     25.3& 4.1/24.0& 3.9     70/70
10  15.63   0   281.7     1347.3    1339/1707   23.2/19.2      6/ 7     24.9& 4.7/25.5& 5.5     65/60
```

```
RUN#  87   DATE:  2/ 7/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME    NET       TIME        WINDSPEED    WIND DIR.   DRY BULB TEMP & DIFF    RELAT
#                         SODIUM    START/END   START/END    START/END        START/END          HUMID

 6   2.86   5   322.5     262.3    1109/1710   21.5/          8/ 7     25.8& 4.0/       &      71/
 9   2.11   1   570.8     369.3    1058/1700   17.6/          7/ 7     26.0& 4.0/       &      71/
10   1.21   1   490.4     182.3    1123/1715   15.8/          8/ 8     26.2& 4.2/       &      70/
```

Low RPM on Station 6. All stations caught in light rain.

```
RUN#  88   DATE:  2/ 8/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME      NET       TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                        SODIUM    START/END     START/END    START/END         START/END           HUMID

 3   3.76   0   319.2      367.3    1258/1634     18.3/30.0      11/12      27.0C 4.0/28.5C 3.7      71/74
 4   4.01   0   325.6      399.3    1249/1609     16.1/20.3      12/12      27.0C 3.8/25.1C 4.9      72/67
 5   3.97   3   381.8      464.3    1204/1547     17.9/16.3      11/11      28.0C 4.5/29.1C 5.3      69/60
 6   5.17   0   380.9      602.3    1041/1428      9.4/22.4      10/10      25.2C 2.0/29.0C 6.0      84/60
 7   3.50   3   325.7      349.3    1236/1558     16.6/15.5      10/11      27.0C 4.0/28.8C 5.8      71/61
 8   4.27   0   334.2      437.3    1151/1533     15.5/19.0      10/11      27.3C 3.3/29.8C 5.8      76/62
 9   5.45   0   370.2      617.3    1025/1413     11.2/15.5      10/10      25.0C 1.9/28.7C 5.5      85/63
10   3.94   5   234.1      282.3    1055/1438      7.9/16.4       9/12      25.0C 2.0/28.0C 5.5      84/63
```

Low RPM on Station 10.

```
RUN#  89   DATE:  2/11/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME      NET       TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                        SODIUM    START/END     START/END    START/END         START/END           HUMID

 3   1.72   0   350.2      184.3    1000/1416      8.9/12.6       2/ 5      14.5C 5.0/19.0C 4.5      52/62
 4  12.57   0   403.3     1552.3    1014/1434      4.4/ 9.4       1/ 5      15.9C 5.4/19.5C 5.5      51/54
 5   5.03   0   423.6      652.3    1038/1500      7.5/ 2.3       1/ 3      17.0C 5.0/20.0C 5.5      55/55
 6   2.98   3   360.2      328.3    1251/1647      8.6/ 4.4      14/12      19.5C 5.5/21.0C 6.5      54/49
 7   1.98   0   415.6      239.3    1025/1446      5.9/11.0      16/ 5      15.8C 4.6/20.0C 5.5      57/55
 8   1.82   0   349.7      194.3    1051/1514      8.9/11.8       1/ 5      16.2C 4.7/20.0C 5.0      57/58
 9   1.78   3   366.0      195.3    1234/1634      6.4/ 5.5      15/ 2      19.5C 6.0/20.0C 6.0      51/51
10   2.02   3   352.2      217.3    1305/1703      5.6/11.2       1/ 7      19.5C 6.0/19.8C 4.8      51/60
```

```
RUN#  90   DATE:  2/12/74    COOLING DEVICE CODE=2

ST    PHI   C    VOLUME      NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                          SODIUM   START/END    START/END   START/END        START/END            HUMID

 3   2.79   0    264.0      225.3    1336/1646     8.3/12.2      2/ 3     22.2C 6.2/21.3C 6.1      53/52
 4   2.81   0    287.3      247.3    1325/1635     9.9/ 7.3      4/ 2     23.0C 7.0/21.8C 6.8      49/48
 5   2.84   0    320.7      279.3    1305/1621     9.7/ 7.4      3/ 2     22.0C 6.5/22.1C 6.1      50/53
 6   1.93   0    298.5      173.3    1031/1528     7.8/ 8.9     15/ 2     17.5C 5.2/21.5C 6.6      54/49
 7   2.71   0    288.5      239.3    1317/1628     3.2/ 6.6     15/ 2     22.0C 6.5/21.5C 6.3      50/51
 8   2.94   0    391.4      352.3    1150/1612    10.4/ 7.0     15/ 3     20.0C 6.0/22.0C 6.0      51/54
 9   2.27   3    468.5      425.3    1015/1518     8.3/ 8.0     14/ 2     16.3C 4.3/21.8C 6.8      60/48
10   1.96   0    419.4      239.3    1045/1548    10.9/ 6.9     15/ 2     18.0C 5.0/21.1C 9.3      57/30


RUN#  91   DATE:  2/13/74    COOLING DEVICE CODE=2

ST    PHI   C    VOLUME      NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                          SODIUM   START/END    START/END   START/END        START/END            HUMID

 3   3.11   0    430.5      409.3     944/1444     6.4/ 8.6     16/ 3     18.8C 4.8/23.5C 6.7      59/51
 4   4.18   0    461.1      549.3    1000/1455     4.9/ 6.7     16/ 4     19.8C 4.8/23.5C 7.0      60/49
 5   3.47   0    455.4      484.3    1018/1515     5.5/11.6     15/ 4     20.3C 5.1/24.0C 7.0      58/49
 6   4.42   0    319.8      432.3    1240/1610     9.4/10.1      7/ 4     23.2C 6.3/23.4C 6.5      53/52
 7   3.10   0    461.3      437.3    1009/1505     6.9/11.0      1/ 3     20.0C 5.1/23.3C 6.7      58/51
 8   3.59   0    357.2      352.3    1030/1526     8.8/12.6      2/ 4     20.9C 5.6/23.0C 6.0      55/55
 9   4.21   0    307.0      395.3    1226/1558     8.1/ 9.7      4/ 2     24.0C 6.8/23.8C 6.7      50/51
10   3.51   0    302.7      325.3    1251/1624     6.2/11.0      2/ 4     23.5C 7.3/23.3C 6.3      47/53
```

```
RUN#  92   DATE:  2/14/74   COOLING DEVICE CODE=2

ST    PHI    C    VOLUME       NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM    START/END    START/END   START/END        START/END           HUMID

 3    4.22   0    351.6      454.3     1042/1447    12.4/11.5      2/ 3     21.0C 4.2/24.0C 5.0      66/62
 4    4.00   0    352.7      432.3     1103/1458     8.9/ 9.0      3/ 4     23.5C 5.9/24.9C 5.8      56/58
 5    4.56   0    346.2      483.3     1143/1516    10.0/14.1      3/ 4     23.8C 5.8/24.5C 5.9      57/57
 6    4.52   0    321.4      444.3     1311/1633     6.9/ 7.2      2/ 5     24.9C 6.4/24.6C 5.6      54/59
 7    4.39   0    392.8      527.3     1114/1509    12.7/11.8      3/ 3     22.3C 5.1/24.0C 5.1      60/61
 8    4.11   0    269.4      339.3     1213/1529    14.5/17.3      4/ 5     23.2C 4.9/23.1C 4.9      63/63
 9    3.99   0    310.2      369.3     1259/1622    10.9/11.9      3/ 6     24.7C 6.6/25.1C 5.3      52/55
10    3.68   0    289.0      325.3     1322/1544    10.0/ 8.5      1/ 8     25.5C 7.0/24.5C 6.5      50/53
```

```
RUN#  93   DATE:  2/15/74   COOLING DEVICE CODE=2

ST    PHI    C    VOLUME       NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM    START/END    START/END   START/END        START/END           HUMID

 3    5.31   0    460.1      747.3     1005/1521     7.0/18.1      2/ 8     22.8C 3.9/25.5C 4.5      70/67
 4   29.72   0    480.6     4372.3     1028/1520     2.1/15.7      5/ 6     24.0C 4.8/25.8C 4.9      63/65
 5    8.45   0    467.3     1209.3     1101/1555     7.5/15.9      5/ 6     25.0C 4.5/26.2C 4.9      67/65
 6    5.41   0    390.9      647.3     1318/1719     7.9/11.7      4/ 8     25.3C 5.0/25.0C 4.7      64/65
 7    0.65   0    481.5       95.6     1049/1543     4.8/14.4      6/ 6     24.5C 4.6/25.9C 6.0      65/57
 8    5.10   0    334.4      522.3     1117/1610     7.7/16.7      6/ 7     24.0C 4.0/25.5C 4.5      69/67
 9    5.15   0    356.9      562.3     1305/1705    14.3/11.5      4/ 6     25.1C 4.3/25.7C 4.7      68/66
10    5.56   0    336.5      572.3     1328/1742     9.0/12.6      4/ 7     26.2C 4.9/24.8C 4.8      65/64
11   11.83   0    372.0     1347.3     1235/1629    12.0/22.5      4/ 7     24.2C 3.9/25.0C 4.5      70/67
```

```
RUN#  94   DATE:  2/18/74   COOLING DEVICE CODE=2

ST    PHI    C    VOLUME      NET       TIME       WINDSPEED    WIND DIF.   DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM   START/END    START/END    START/END        START/END          HUMID

 3    3.88   0    280.0      332.3    1056/1500    11.0/16.6      2/ 7     20.2& 5.0/22.9& 4.8     55/63
 4    7.03   0    387.7      834.3    1105/1523    10.7/20.5      1/ 7     21.3& 5.3/22.5& 4.5     58/65
 5    4.05   0    257.8      319.3    1121/1549    11.3/17.9      3/ 6     20.5& 4.0/23.3& 4.5     67/65
 6    4.33   0    331.8      439.3    1343/1710    18.7/15.4      5/ 7     22.7& 4.9/22.0& 5.8     62/55
 7    3.61   0    318.5      352.3    1113/1535    10.7/17.1      2/ 6     21.1& 5.3/22.2& 4.7     58/63
 8    4.67   0    403.9      577.3    1130/1605    12.6/18.0      3/ 6     21.5& 4.7/21.9& 4.4     63/65
 9    3.91   0    286.8      343.3    1310/1723    16.4/10.6      4/ 5     23.8& 5.8/22.1& 5.6     57/56
10    3.43   0    270.5      284.3    1352/1700    17.7/16.3      5/ 6     23.8& 6.0/23.0& 5.9     55/56
```

```
RUN#  95   DATE:  2/19/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET       TIME       WINDSPEED    WIND DIF.   DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM   START/END    START/END    START/END        START/END          HUMID

 3   12.31   0    437.3     1647.3    1046/1455    37.5/30.4      9/10     25.2& 3.2/28.9& 7.1     76/54
 4    9.94   0    418.0     1272.3    1054/1505    34.4/36.1      9/10     25.2& 3.4/26.0& 4.1     74/70
 5   10.50   0    372.7     1209.3    1209/1528    30.7/26.2      9/10     26.6& 4.4/26.2& 4.0     68/71
 6    7.03   0    238.0      512.3    1313/1632    24.1/21.6      9/ 9     26.0& 4.7/26.2& 4.0     66/71
 7    9.18   0    345.9      972.3    1200/1518    25.0/25.4      8/10     26.2& 4.7/26.0& 4.2     66/70
 8   10.63   0    352.7     1147.3    1220/1543    37.5/32.6      9/10     25.2& 4.1/25.6& 3.7     70/73
 9    7.17   0    357.3      784.3    1300/1645    22.3/15.4      9/ 9     26.3& 5.1/26.2& 4.4     64/68
10    7.49   0    233.2      534.3    1328/1620    24.9/20.7      9/ 9     26.0& 3.9/26.8& 5.3     72/63
```

```
RUN#  96   DATE:  2/20/74   COOLING DEVICE CODE=1

ST    PHI    C   VOLUME      NET       TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                          SODIUM   START/END    START/END    START/END        START/END           HUMID

 3    7.49   0   354.4      834.3   1300/1715    15.2/14.3      6/ 6      26.8C 5.9/26.0C 3.1      59/77
 4   14.04   0   325.3     1359.3   1253/1636    12.7/12.9      6/ 5      27.2C 4.6/26.4C 3.4      67/74
 5    8.89   0   380.1     1034.3   1225/1609    10.0/14.1      4/ 6      27.2C 5.0/27.0C 3.5      65/74
 6    8.58   0   383.1     1006.9   1046/1459     2.5/15.7     13/ 5      25.4C 3.2/26.3C 4.5      76/69
 7    7.62   3   375.5      676.3   1237/1625    13.1/15.0      4/ 6      26.4C 4.9/26.0C 3.8      65/72
 8    8.01   0   347.4      851.3   1214/1555    10.6/19.6      6/ 5      26.0C 3.0/25.8C 2.6      78/81
 9    7.40   0   382.4      856.3   1029/1442     5.0/11.8     15/ 4      24.8C 2.8/25.7C 4.7      78/66
10    7.02   0   305.2      656.3   1059/1516     8.5/16.8     15/ 4      26.0C 4.0/26.2C 4.2      71/70



RUN#  97   DATE:  2/21/74   COOLING DEVICE CODE=1

ST    PHI    C   VOLUME      NET       TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                          SODIUM   START/END    START/END    START/END        START/END           HUMID

 3    7.57   0   459.9     1121.3    915/1409    14.9/21.2      6/ 7      24.5C 1.6/27.0C 3.0      87/79
 4   14.72   0   329.7     1485.3    929/1432    16.6/25.4      6/ 6      25.2C 2.0/27.1C 2.3      84/83
 5    7.15   0   505.8     1106.3    948/1456    21.1/27.4      6/ 7      25.8C 1.8/26.9C 2.9      86/79
 6    7.15   0   539.8     1181.3   1058/1630    18.9/17.9      6/ 7      26.2C 2.4/25.8C 1.8      82/86
 7    7.06   0   519.1     1121.3    937/1445    12.2/24.3      6/ 6      25.2C 2.2/26.2C 2.8      83/79
 8    7.42   0   496.2     1126.3   1000/1514    24.1/30.4      6/ 7      25.5C 2.0/26.6C 2.6      84/81
 9    7.19   0   379.7      834.3   1045/1614    22.6/24.1      5/ 6      26.0C 2.5/26.5C 3.2      81/76
10    6.79   0   500.8     1041.3   1110/1642    15.4/17.9      6/ 6      27.0C 3.0/26.4C 3.4      78/75
```

```
RUN#  58   DATE:  2/22/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME     NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                          SODIUM    START/END    START/END   START/END        START/END           HUMID

 3    8.06   0    503.4     1241.3     848/1400    17.8/28.6      8/10      26.0C 1.5/26.7C 2.0     89/85
 4    7.53   0    432.4      956.3     900/1406    17.1/28.4      9/ 9      25.8C 1.0/26.7C 2.3     92/83
 5    6.07   1    476.9      886.3     930/1424    18.4/25.2      9/10      26.0C 1.5/27.0C 2.2     89/84
 6    6.34   0    561.7     1089.3    1138/1732    16.3/13.0      4/10      27.9C 3.7/27.3C 4.3     74/69
 7    5.48   1    521.0      874.3     912/1422    14.3/21.0      9/10      25.1C 1.8/26.5C 2.3     85/83
 8    8.54   1    333.2      871.3    1003/1435    19.4/23.0      9/10      26.1C 2.0/28.0C 4.0     85/72
 9    6.70   0    565.4     1161.3    1129/1720    15.2/11.7      8/ 9      27.9C 3.5/27.1C 4.5     75/68
10    7.12   0    517.1     1126.3    1148/1750    20.0/11.4      9/10      27.0C 3.8/26.5C 4.0     72/71
```

```
RUN#  59   DATE:  2/23/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME     NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                          SODIUM    START/END    START/END   START/END        START/END           HUMID

 3   11.76   0    346.1     1246.3    1018/1500    15.5/17.9      2/ 2      18.5C 4.2/24.2C 3.2     64/75
 4    9.26   0    439.6     1246.3    1027/1509    10.8/ 9.5      2/ 3      20.0C 5.0/24.0C 3.5     58/73
 5   10.55   0    304.7      984.3    1101/1526     9.2/ 8.9      3/ 4      20.7C 4.7/24.9C 3.8     62/71
 6    7.97   3    516.3     1260.3    1213/1755     9.2/ 7.9      3/ 4      22.5C 3.6/24.4C 4.1     71/69
 7    9.60   0    450.1     1323.3    1048/1518     9.2/13.3      2/ 2      19.2C 3.9/23.0C 3.0     67/76
 8   11.58   0    412.0     1460.3    1114/1555     9.4/13.4      3/ 3      20.2C 3.7/24.3C 2.5     69/80
 9    9.03   0    506.0     1398.3    1203/1748     7.8/ 9.5      2/ 4      21.9C 4.9/24.2C 3.7     61/71
10   10.99   0    489.9     1648.3    1221/1800     7.5/10.1      1/ 4      22.0C 4.1/25.0C 4.7     67/65
```

```
RUN# 100   DATE:  2/25/74   COOLING DEVICE CODE=1

ST    PHI   C   VOLUME      NET       TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM   START/END    START/END   START/END        START/END           HUMID

 3   3.14   0   537.9     516.3    1024/1531    17.4/15.3      1/ 1     19.2& 3.8/21.4& 5.1     67/60
 4   3.45   0   489.4     516.3    1035/1542     9.8/14.3     16/16     20.4& 3.6/21.3& 5.2     70/59
 5   3.48   0   346.6     371.3    1059/1606    18.4/20.1     16/16     20.5& 4.0/20.0& 4.0     67/66
 6   3.32   4   314.0     319.3    1252/1749    20.2/11.5     16/16     22.3& 5.1/17.8& 4.6     60/60
 7   3.64   0   502.4     555.3    1045/1555    19.1/17.4      1/16     20.0& 3.5/20.6& 4.5     70/63
 8   3.76   0   370.9     426.3    1113/1619    19.2/17.4      1/16     20.3& 4.2/20.0& 4.1     65/65
 9   3.46   4   240.1     254.3    1241/1805    13.1/13.7     16/16     22.0& 5.0/17.6& 4.6     61/60
10   3.30   4   391.9     356.3    1303/1739    17.1/ 9.9     16/16     22.0& 5.0/18.0& 4.5     61/61
```

```
RUN# 101   DATE:  2/26/74   COOLING DEVICE CODE=1

ST    PHI   C   VOLUME      NET       TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM   START/END    START/END   START/END        START/END           HUMID

 3   0.05   0   478.7       7.2     951/1456    13.1/27.1     16/16      8.5& 3.3/15.8& 6.8     60/39
 4   0.05   0   505.2       8.2    1003/1509    20.5/15.2     16/16      7.6& 3.4/15.9& 5.9     61/47
 5   0.04   4   352.1       4.6    1033/1549    20.6/18.7     16/16      9.8& 3.6/15.5& 5.2     59/43
 6   0.05   4   440.1       6.7    1253/1734    31.0/14.2     15/16     13.0& 5.2/15.0& 6.8     48/37
 7   0.05   0   542.3       8.9    1020/1535    29.0/26.8     16/ 1     10.0& 4.0/15.4& 6.9     55/38
 8   0.04   0   408.7       5.2    1048/1607    16.8/21.4     16/ 1      9.2& 3.7/16.0& 7.1     57/38
 9   0.05   4   463.4       6.8    1238/1723    27.4/16.9     15/16     12.5& 5.0/15.0& 6.4     49/41
10   0.05   4   457.4       7.4    1305/1745    17.3/18.6     15/16     13.9& 5.7/14.5& 6.5     44/39
```

```
RUN# 102   DATE:  2/27/74   COOLING DEVICE CODE=1

ST   PHI    C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM   START/END    START/END   START/END        START/END          HUMID

 3  11.19   0   455.7    1550.3   1026/1544    14.3/23.3      1/ 3     14.0E 3.0/18.0E 4.1     70/64
 4   6.80   0   293.6     611.3   1042/1505     6.9/11.7     15/ 2     15.8E 3.8/20.5E 5.5     64/55
 5   8.33   0   312.4     796.3   1128/1439     9.4/12.2     16/ 1     18.5E 4.5/18.3E 5.3     61/55
 6   9.41   0   332.0     556.3   1245/1631    10.4/17.9     16/ 2     15.5E 3.5/19.2E 5.0     67/58
 7   7.70   0   371.9     876.3   1052/1453    13.3/14.6     16/ 2     15.5E 3.3/18.7E 5.2     68/56
 8   9.42   0   232.7     671.3   1144/1422    12.7/11.8     16/ 1     15.5E 1.6/17.2E 4.4     84/61
 9  11.39   0   411.5    1435.3   1235/1646    10.0/12.8     16/ 2     15.8E 3.5/18.4E 4.4     67/62
10   8.45   0   309.9     801.3   1255/1620    11.1/11.7     16/ 2     15.7E 3.5/19.0E 5.0     67/58
```

```
RUN# 103   DATE:  2/28/74   COOLING DEVICE CODE=1

ST   PHI    C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM   START/END    START/END   START/END        START/END          HUMID

 3  14.55   0   417.8    1860.3   1050/1520    22.1/14.1      5/ 5     19.2E 4.2/23.0E 6.3     64/57
 4  17.43   0   273.8    1460.3   1107/1525    14.0/10.2      4/ 5     20.0E 4.8/22.8E 6.8     60/50
 5  18.82   0   279.6    1610.3   1146/1541    11.0/11.2      4/ 4     21.3E 5.0/22.0E 5.8     60/55
 6  12.47   0   410.1    1560.3   1318/1736    16.1/ 9.3      5/ 4     24.9E 6.5/21.5E 5.0     52/60
 7  14.58   0   403.0    1810.3   1126/1534    16.7/11.9      4/ 4     20.8E 5.6/21.7E 4.7     55/63
 8  13.02   0   224.4     896.3   1205/1550    16.4/17.0      5/ 4     20.3E 4.0/22.6E 5.6     67/57
 9  11.64   0   392.8    1358.3   1309/1720    20.3/12.2      4/ 3     22.8E 5.8/21.8E 5.5     56/57
10  10.33   0   395.0    1274.3   1327/1748    16.1/ 7.9      4/ 3     23.5E 6.4/21.9E 4.6     53/63
```

```
RUN# 104   DATE:  3/ 1/74   COOLING DEVICE CODE=1

ST   PHI    C   VOLUME     NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                        SODIUM    START/END    START/END   START/END        START/END         HUMID

 3   6.87   0   474.0     596.3     555/1501    12.8/18.8     2/ 3     19.0C 2.5/24.0C 5.8     79/57
 4   5.22   0   420.4     671.3    1020/1506     9.0/10.1     2/ 4     22.2C 4.4/24.0C 5.6     65/58
 5   5.49   0   429.1     721.3    1034/1517    12.9/12.0     2/ 3     21.5C 4.3/24.5C 6.3     65/54
 6   4.96   0   481.9     731.3    1135/1653    12.8/12.0     1/ 3     23.5C 4.6/23.0C 5.8     65/57
 7   5.96   0   469.3     856.3    1028/1512    15.5/21.7     2/ 3     21.5C 4.0/23.3C 5.3     68/60
 8   6.02   0   304.6     561.3    1049/1524    14.8/21.7     2/ 3     22.2C 4.0/24.0C 5.7     68/57
 9   5.50   0   479.0     806.3    1121/1642    15.5/11.6     2/ 2     23.2C 5.1/23.5C 6.3     61/53
10   4.90   0   294.1     441.3    1145/1700    10.7/11.2     1/ 2     22.8C 4.5/23.1C 5.8     65/57


RUN# 105   DATE:  3/ 7/74   COOLING DEVICE CODE=1

ST   PHI    C   VOLUME     NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                        SODIUM    START/END    START/END   START/END        START/END         HUMID

 3   4.29   0   344.6     452.3    1107/1458    20.7/21.6     6/ 5     25.3C 2.8/26.5C 3.1     79/77
 4   8.04   0   340.4     837.3    1119/1511    16.4/12.6     6/ 5     25.9C 3.1/27.0C 3.8     77/72
 5   5.45   0   393.1     655.3    1148/1539    22.3/15.5     5/ 5     26.7C 2.7/27.0C 3.8     80/72
 6   3.33   0   304.4     310.3    1355/1704    11.8/16.7     4/ 5     27.0C 4.0/24.5C 2.3     71/82
 7   2.91   0   360.0     320.3    1130/1527    16.9/20.8     5/ 4     26.0C 3.0/25.7C 3.1     78/77
 8   4.17   0   246.0     315.3    1312/1556    22.5/19.3     4/ 4     26.5C 3.0/26.8C 2.8     78/79
 9   3.55   0   361.5     392.3    1343/1732    16.4/17.7     5/ 4     26.9C 3.9/26.0C 3.1     72/77
10   2.58   0   227.1     207.3    1408/1651    11.7/13.0     5/ 3     28.1C 4.6/25.5C 3.3     68/75
```

```
RUN# 106   DATE:  3/ 8/74   COOLING DEVICE CODE=1

ST   PHI   C   VOLUME      NET      TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                       SODIUM   START/END    START/END    START/END        START/END            HUMID

 3   9.63  0   409.4    1207.3   1016/1514    20.2/16.8       5/ 4      25.9& 2.9/26.8& 3.9      79/72
 4   7.57  0   473.8    1097.3   1034/1528    16.3/17.8       5/ 5      26.0& 2.5/27.7& 4.2      81/71
 5   6.16  0   497.2     937.3   1107/1555    23.3/17.6       5/ 4      26.7& 3.0/27.4& 3.5      78/75
 6   5.90  0   540.8     977.3   1250/1831    20.6/13.0       5/ 4      27.0& 3.3/24.3& 2.5      76/80
 7   8.27  0   370.1     937.3   1047/1541    16.4/22.1       5/ 4      26.0& 3.1/26.4& 3.4      77/75
 8   8.11  0   429.9    1067.3   1121/1612    20.5/19.2       6/ 5      26.7& 3.0/27.4& 3.4      78/75
 9   7.22  0   361.0     797.3   1232/1817    19.8/19.4       5/ 4      27.3& 4.1/24.7& 2.7      71/79
10   5.68  0   401.2     697.3   1259/1842    15.8/15.9       5/ 4      27.5& 4.0/24.5& 2.3      72/82
```

```
RUN# 107   DATE:  3/11/74   COOLING DEVICE CODE=1

ST   PHI   C   VOLUME      NET      TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                       SODIUM   START/END    START/END    START/END        START/END            HUMID

 3   1.61  0   534.9     263.3   1029/1630     4.0/18.0       4/ 6      25.2& 4.3/26.3& 5.0      68/64
 4  12.70  0   578.3    2247.3   1045/1651     3.6/15.7       8/ 6      25.0& 3.5/26.3& 4.2      73/70
 5   2.49  5   234.0     177.3   1150/1729     9.0/15.1       6/ 6      27.8& 6.0/26.2& 4.7      60/66
 6   2.03  0   558.6     347.3   1347/1949     9.7/12.8       5/ 6      27.0& 6.5/22.8& 2.8      56/78
 7   1.61  0   583.8     288.3   1057/1705    11.2/11.2       3/ 6      25.0& 3.5/26.5& 5.5      73/61
 8   1.79  0   405.7     222.3   1206/1743     9.9/12.2       6/ 7      27.0& 5.1/25.4& 4.0      64/70
 9   1.94  0   560.9     332.3   1337/1926    15.5/11.5       5/ 4      26.7& 5.4/23.2& 2.7      62/79
10   1.91  0   477.1     278.3   1355/1957    12.9/13.7       4/ 5      28.0& 6.1/22.7& 2.5      59/80
11   5.09  0   447.9     697.3   1139/1716    12.4/12.9       6/ 7      27.0& 4.0/26.0& 4.0      71/71
```

Low RPM on Station 5.

```
RUN# 108   DATE:  3/12/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF      RELAT
 #                           SODIUM    START/END    START/END    START/END         START/END             HUMID

 3    2.96   0    286.5      259.5    1023/1447      2.9/26.6     14/ 9      24.8& 3.6/27.3& 3.3       73/76
 4    3.47   0    336.1      357.5    1038/1457      4.1/23.1     14/ 9      25.5& 3.5/27.0& 3.1       74/77
 5    2.96   0    412.9      374.5    1103/1519     11.5/17.3     10/10      26.0& 2.4/26.0& 4.8       82/66
 6    2.63   0    373.2      300.5    1320/1708     11.9/11.9      9/ 9      27.0& 5.2/27.2& 6.9       63/54
 7    2.74   0    419.1      351.5    1050/1507      5.6/13.9     12/ 9      25.7& 4.0/28.0& 5.0       71/66
 8    3.24   0    306.8      304.5    1202/1532      9.1/19.3     13/10      26.5& 5.6/27.0& 5.0       60/65
 9    2.61   0    328.3      262.5    1304/1657      6.8/12.4      8/ 9      27.0& 5.0/26.5& 6.2       65/57
10    2.49   0    316.6      241.5    1328/1716     11.9/11.9      9/ 9      27.0& 5.2/27.2& 6.9       63/54
```

```
RUN# 109   DATE:  3/13/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF      RELAT
 #                           SODIUM    START/END    START/END    START/END         START/END             HUMID

 3    1.92   0    344.2      202.3    1013/1427     17.1/12.3     15/16      23.9& 2.7/29.0& 6.8       79/55
 4    1.65   0    381.3      192.3    1021/1438     16.3/ 6.4     15/15      24.4& 2.7/27.5& 6.6       79/56
 5    1.59   0    406.4      197.3    1044/1505     18.4/ 7.4     15/16      24.8& 3.7/27.5& 6.5       72/56
 6    1.24   1    389.3      147.3    1158/1555     16.1/         14/ 6      27.5& 5.6/     &          62/
 7    1.51   0    293.0      135.3    1035/1454     18.4/ 8.6     15/15      24.8& 3.8/27.3& 6.5       71/56
 8    1.40   0    238.2      102.3    1105/1518     13.7/ 3.6     16/14      25.9& 4.7/27.6& 6.6       66/56
 9    0.33   1    398.9       39.8    1149/1600     17.6/         14/ 6      27.3& 5.5/     &          62/
10    1.34   1    300.9      123.3    1207/1551     14.3/         15/ 7      25.8& 4.5/     &          67/
```

```
RUN# 110   DATE:  3/14/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME       NET        TIME       WINDSPEED    WIND DIR.     DRY BULB TEMP & DIFF      RELAT
 #                            SODIUM    START/END    START/END    START/END          START/END            HUMID

 3    4.25   0    220.1       286.5    1049/1322      7.6/15.7       5/ 4      22.0& 2.0/25.4& 3.5       83/74
 4    4.95   0    261.9       396.5    1059/1345      2.5/11.0      16/ 5      23.0& 2.7/26.0& 4.5       79/68
 5    6.27   0    232.8       446.5    1139/1429      2.3/11.3      14/ 4      25.0& 3.8/26.3& 4.8       71/66
 6    7.51   0    331.5       761.5    1238/1603     15.8/22.9       5/ 5      26.0& 3.8/25.6& 4.4       72/68
 7    5.52   0    261.3       441.5    1106/1351      5.3/10.3       9/ 3      23.2& 2.4/26.0& 4.2       81/70
 8    7.13   0    181.6       396.5    1151/1416      5.5/16.1       7/ 4      25.0& 3.0/26.1& 3.3       77/76
 9    7.76   0    360.9       857.5    1227/1615      8.4/15.9       1/ 3      26.0& 4.0/26.0& 4.0       71/71
10    7.44   0    267.7       609.5    1250/1552      8.5/15.8       5/ 2      26.8& 4.6/26.5& 4.4       67/68




RUN# 111   DATE:  3/15/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME       NET        TIME       WINDSPEED    WIND DIR.     DRY BULB TEMP & DIFF      RELAT
 #                            SODIUM    START/END    START/END    START/END          START/END            HUMID

 3  10.65    0    221.4       721.5    1250/1510     27.4/25.9       6/ 6      25.5& 2.7/25.0& 2.8       79/78
 4  13.31    0    222.5       906.5    1300/1516     22.3/19.7       6/ 6      26.2& 2.7/25.0& 2.2       80/83
 5  11.21    0    237.1       813.5    1318/1530     24.1/20.5       6/ 6      26.2& 2.7/25.7& 1.8       80/86
 7  10.47    0    229.1       734.5    1308/1522     25.7/17.5       6/ 5      25.3& 3.3/24.8& 2.9       75/77
```

```
RUN# 112   DATE:  3/18/74   COOLING DEVICE CODE=2

 ST    PHI   C   VOLUME      NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
  #                        SODIUM    START/END    START/END   START/END          START/END          HUMID

  3    3.12  0   278.4      265.5    1200/1512    19.7/16.3      3/ 4     21.7& 5.2/23.5& 5.0     59/62
  4    3.03  0   264.6      245.5    1313/1519    10.5/ 9.5      4/ 4     23.3& 6.8/25.5& 5.6     50/60
  5    3.55  0   294.7      320.5    1236/1531    14.3/15.2      4/ 5     22.4& 6.2/24.6& 5.0     53/63
  6    4.70  0   337.6      485.5    1327/1705    11.2/10.3      5/ 3     24.4& 7.4/24.0& 5.6     47/59
  7    3.19  0   297.5      290.5    1225/1525    15.4/12.6      2/ 4     22.2& 4.7/24.0& 4.5     63/65
  8    3.59  0   259.6      285.5    1249/1540    16.0/16.9      4/ 4     23.5& 5.9/24.0& 4.0     56/69
  9    4.56  0   322.5      450.5    1318/1646    12.3/10.8      3/ 4     25.0& 7.9/24.2& 6.1     44/55
 10    4.50  0   260.2      358.5    1336/1712     8.8/11.0      2/ 3     24.3& 7.3/23.6& 6.0     47/55
```

```
RUN# 113   DATE:  3/19/74   COOLING DEVICE CODE=2

 ST    PHI   C   VOLUME      NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
  #                        SODIUM    START/END    START/END   START/END          START/END          HUMID

  3    2.51  5   310.6      238.5    1022/1600    20.7/18.2      8/ 8     24.4& 3.8/25.9& 3.4     71/75
  4    3.53  0   416.5      450.5    1031/1544    18.7/12.6      7/ 8     25.0& 3.3/25.9& 3.1     75/77
  5    2.20  0   476.3      320.5    1052/1525    12.4/17.3      7/ 8     26.0& 5.0/26.1& 4.2     64/70
  6    3.50  0   453.3      485.5    1207/1645    14.0/11.2      7/ 8     25.1& 4.5/26.9& 4.9     67/65
  7    2.00  0   474.8      290.5    1040/1533    13.0/18.0      6/ 8     25.0& 4.0/25.8& 4.9     70/65
  8    2.64  0   353.1      285.5    1105/1510    15.1/19.1      8/ 8     25.2& 4.6/26.5& 4.2     66/70
  9    3.19  0   462.5      450.5    1155/1551    11.1/ 8.3      6/ 9     25.6& 5.6/27.0& 5.2     60/63
 10    3.16  0   370.5      358.5    1215/1634    12.3/ 7.4      7/ 9     27.0& 5.7/27.6& 5.6     60/62
```

Low RPM on Station 3.

```
RUN# 114    DATE:  3/21/74   COOLING DEVICE CODE=0

ST    PHI    C   VOLUME      NET       TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                          SODIUM   START/END    START/END    START/END         START/END            HUMID

 3    7.05   0   294.4      635.5    1118/1510    32.1/28.8       9/ 9      27.0& 3.2/29.0& 3.5      76/75
 4    6.83   0   354.5      740.5    1127/1518    29.3/27.5      10/ 9      27.5& 3.6/28.5& 3.6      74/75
 5    6.84   0   377.7      790.5    1155/1530    20.3/17.2       9/ 9      28.0& 3.9/29.5& 4.5      73/69
 6    6.06   0   269.7      500.5    1308/1607    12.6/13.8       9/ 9      29.0& 4.8/29.0& 3.7      67/74
 7    6.48   C   386.0      765.5    1136/1525    20.8/17.8       9/ 9      27.7& 4.4/29.0& 4.5      69/69
 8    7.55   0   339.9      785.5    1208/1538    19.6/16.4       9/ 9      28.8& 3.9/29.3& 4.7      73/68
 9    5.72   5   263.2      460.5    1320/1600    15.9/15.6       8/ 7      29.0& 5.0/29.0& 4.0      66/72
10    5.77   5   275.1      485.5    1257/1614    15.0/14.6       8/ 8      28.7& 5.6/28.8& 3.8      62/74
```

Station 9 and 10 each had a large butterfly on one of the meshes.

```
RUN# 115    DATE:  3/22/74   COOLING DEVICE CODE=0

ST    PHI    C   VOLUME      NET       TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                          SODIUM   START/END    START/END    START/END         START/END            HUMID

 3    4.03   0   373.5      460.5    1001/1553    18.3/18.4      10/ 9      26.8& 3.0/29.0& 4.0      78/72
 4    3.95   0   360.3      435.5    1010/1446    11.8/21.2      10/ 9      26.8& 2.9/28.0& 3.2      79/77
 5    4.27   C   344.6      450.5    1114/1434    13.1/18.4       9/ 8      28.7& 4.8/29.8& 4.6      67/69
 6    3.53   0   222.5      240.5    1150/1410    13.1/15.9       9/ 9      28.5& 3.8/30.0& 5.1      73/66
 7    3.78   0   436.7      505.5    1020/1440    13.5/15.8       8/ 8      27.0& 4.4/29.2& 4.4      68/70
 8    4.56   0   333.5      465.5    1054/1427    16.0/19.5       9/ 9      27.8& 3.8/29.8& 4.1      73/72
 9    3.32   C   236.6      240.5    1136/1402    11.3/15.5       9/ 7      29.0& 5.1/30.5& 5.0      65/67
10    3.01   0   259.2      238.5    1153/1415    13.4/17.3       8/ 8      29.0& 5.0/29.9& 4.4      66/71
```

RUN# 116 DATE: 3/25/74 COOLING DEVICE CODE=0

ST #	PHI	C	VOLUME	NET SODIUM	TIME START/END	WINDSPEED START/END	WIND DIR. START/END	DRY BULB TEMP & DIFF START/END	RELAT HUMID
3	10.78	0	489.2	1613.5	1031/1550	24.9/18.0	8/ 8	27.8& 3.9/29.0& 4.1	73/72
4	9.95	0	493.7	1503.5	1050/1556	21.3/22.0	9/ 7	27.4& 2.8/28.3& 3.3	79/77
5	9.81	0	388.2	1165.5	1205/1606	18.2/14.8	8/ 7	28.0& 3.2/29.6& 5.4	77/64
6	7.86	0	370.1	890.5	1251/1639	14.0/12.9	9/ 7	29.0& 5.0/27.6& 3.6	66/74
7	8.21	0	489.9	1230.5	1105/1601	20.2/16.3	8/ 8	27.0& 4.0/28.1& 4.8	71/67
8	7.79	0	373.3	890.5	1148/1614	22.9/16.5	8/ 8	28.0& 4.2/29.1& 4.9	71/66
9	7.66	0	411.9	965.5	1232/1646	14.0/12.9	9/ 7	29.0& 5.3/29.1& 5.3	64/64
10	7.16	0	287.8	630.5	1307/1633	12.5/15.5	8/ 6	29.9& 5.1/27.6& 4.6	66/68

RUN# 117 DATE: 3/26/74 COOLING DEVICE CODE=2

ST #	PHI	C	VOLUME	NET SODIUM	TIME START/END	WINDSPEED START/END	WIND DIR. START/END	DRY BULB TEMP & DIFF START/END	RELAT HUMID
3	8.02	5	363.1	891.3	1043/1508	21.4/16.2	7/ 8	27.0& 3.0/28.2& 3.2	78/77
4	18.80	0	329.3	1894.3	1107/1517	20.8/16.0	7/ 8	28.0& 3.1/28.5& 3.5	78/75
5	8.83	0	359.4	971.3	1201/1530	16.6/14.3	7/ 8	28.0& 3.5/29.0& 4.1	75/72
6	7.75	0	318.8	756.3	1308/1623	14.5/13.0	7/ 6	29.0& 4.6/28.7& 4.8	68/67
7	11.98	0	408.2	1456.3	1121/1525	19.3/18.8	7/ 6	27.4& 3.4/28.0& 4.4	75/70
8	8.86	0	312.2	846.3	1220/1539	17.1/21.8	6/ 7	27.4& 3.4/27.3& 3.4	75/75
9	6.88	0	332.9	701.3	1250/1615	14.7/ 8.4	7/ 6	28.2& 4.2/29.3& 4.4	71/70
10	7.78	0	250.3	556.3	1328/1630	20.8/13.3	6/ 5	28.1& 4.1/27.1& 3.6	71/74

Airboat passed Station 3 while removing the meshes. Possible contamination from heavy spray.

```
RUN# 118   DATE:  3/27/74   COOLING DEVICE CODE=2

 ST    PHI   C   VOLUME      NET       TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF    RELAT
  #                        SODIUM   START/END    START/END    START/END        START/END            HUMID

  3    5.90  0   182.9     330.5   1546/1750    15.6/14.2      7/ 7      28.3& 4.3/26.5& 2.8      70/79
  4   26.84  0   171.7    1410.5   1600/1756    15.9/10.9      6/ 6      27.8& 4.6/26.7& 2.7      68/80
  5    6.06  0   170.1     315.5   1713/1853    11.3/10.1      6/ 6      27.5& 3.8/26.2& 2.4      73/82
  7    6.31  0   187.8     345.5   1610/1804    15.8/12.8      6/ 6      27.6& 4.1/26.0& 2.9      71/79
  8    6.13  0   152.1     285.5   1702/1841    18.2/13.2      7/ 7      27.5& 4.0/26.7& 3.1      72/77




RUN# 119   DATE:  3/29/74   COOLING DEVICE CODE=0

 ST    PHI   C   VOLUME      NET       TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF    RELAT
  #                        SODIUM   START/END    START/END    START/END        START/END            HUMID

  3    3.28  1   132.8     133.5   1135/1318    11.6/          10/10     28.0& 4.5/    &          69/
  4    3.17  1   111.8     108.5   1153/1324    13.6/          10/11     29.6& 4.6/    &          69/
  7    2.94  1   114.9     103.5   1209/1330     9.2/          11/11     29.4& 5.6/    &          63/
```

```
RUN# 120   DATE:  3/30/74   COOLING DEVICE CODE=2

ST    PHI    C   VOLUME       NET        TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM   START/END    START/END    START/END         START/END            HUMID

 3  16.55   0   619.1      3515.5    1025/1755    19.0/32.6      12/13      27.6& 4.6/28.5& 6.5      68/57
 4   4.22   0   382.4       493.5    1200/1747    24.6/19.0      12/13      29.4& 4.4/28.9& 5.9      70/60
 5   2.77   0   431.3       365.5    1236/1636    17.1/21.7      12/13      30.0& 6.0/30.0& 7.0      61/55
 7   2.79   0   544.7       465.5    1213/1738    22.8/20.3      13/12      28.9& 5.9/28.6& 6.8      60/55
 8   2.65   0   332.8       269.5    1254/1623    22.8/24.4      13/13      30.8& 7.8/30.2& 8.0      52/50
```

```
RUN# 121   DATE:  3/31/74   COOLING DEVICE CODE=2

ST    PHI    C   VOLUME       NET        TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM   START/END    START/END    START/END         START/END            HUMID

 3   2.47   0   311.5       235.5    1257/1700    13.1/19.0      6/ 7       27.9& 7.0/27.9& 6.9      54/54
 4 112.08   0   346.6    11,890.5    1305/1707    13.0/13.4      6/ 8       28.5& 6.5/28.1& 5.6      57/62
 5   8.40   0   351.3       903.5    1350/1719    20.4/11.2      6/ 7       27.8& 5.3/27.9& 6.0      64/60
 6   1.91   0   186.1       108.5    1448/1752    11.2/ 8.7      6/ 6       28.5& 7.9/27.2& 6.1      49/58
 7   2.55   0   276.6       215.5    1343/1714    11.0/11.9      4/ 8       28.5& 9.2/27.9& 6.4      42/57
 8   2.20   0   297.4       200.5    1400/1727    15.3/ 9.3      6/ 8       27.4& 6.3/28.2& 7.5      57/51
 9   1.96   0   280.5       168.5    1500/1800     9.1/ 8.9      5/ 5       29.7& 9.7/27.3& 5.5      41/62
10   1.68   0   211.3       108.5    1439/1747    13.5/12.2      7/ 8       28.8& 8.5/27.8& 7.8      46/49
```

Very high concentration at Station 4 is probably caused by the operating spray modules. However, additional contamination from unknown sources is possible. Input data were checked and found to be accurate.

```
RUN# 122   DATE:  4/ 3/74   COOLING DEVICE CODE=0

ST    PHI    C    VOLUME      NET*      TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM   START/END    START/END   START/END      START/END            HUMID

 3    9.99   0    272.6      933.5    1005/1256    29.0/21.5     8/ 8     27.0& 4.0/29.0& 4.8     71/67
 4    8.45   0    252.6      653.5    1017/1302    27.2/19.2     8/ 8     27.8& 3.6/29.5& 4.5     74/69
 5    8.77   0    220.3      591.5    1103/1315    18.7/24.1     8/ 7     28.4& 5.1/27.9& 4.5     65/69
 6    7.92   0    145.9      353.5    1229/1358    21.8/20.4     7/ 7     28.0& 5.2/29.3& 5.1     65/66
 7    8.43   0    261.0      678.5    1030/1309    21.8/18.5     7/ 7     26.3& 4.2/28.5& 4.9     70/67
 8    8.78   0    229.4      616.5    1053/1325    22.3/22.2     8/ 7     28.2& 4.9/27.6& 3.7     67/74
 9    7.08   0    125.4      271.5    1243/1405    14.3/16.0     8/ 7     29.6& 6.1/28.0& 4.5     60/69
10    7.16   0    138.5      303.5    1217/1353    19.9/18.8     8/ 6     29.0& 5.0/29.5& 4.9     66/67
```

```
RUN# 123   DATE:  4/ 4/74   COOLING DEVICE CODE=0

ST    PHI    C    VOLUME      NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM   START/END    START/END   START/END      START/END            HUMID

 3   18.33   0    210.9     1183.5    1117/1409    32.7/23.9     8/ 8     26.9& 2.9/28.9& 4.0     79/72
 4   14.21   0    275.6     1198.5    1125/1416    28.1/25.6     8/ 8     28.0& 3.3/29.3& 4.3     76/71
 5   14.19   0    279.0     1211.5    1150/1428    21.1/21.0     8/ 8     29.8& 4.2/29.7& 4.7     72/68
 6   11.75   0    181.2      651.5    1320/1512    19.9/15.1     8/ 8     29.5& 5.5/29.5& 5.3     63/65
 7   14.47   0    273.6     1211.5    1139/1421    15.8/14.9     8/ 8     28.2& 4.5/29.7& 5.2     69/65
 8   14.65   0    257.2     1153.5    1202/1438    26.3/20.0     8/ 8     29.4& 3.8/30.0& 5.0     74/67
 9   11.58   0    183.7      651.5    1308/1505    18.3/17.0     7/ 8     29.3& 5.3/29.8& 5.8     64/62
10   11.15   0    164.5      561.5    1328/1524    18.1/16.2     7/ 8     30.0& 5.0/29.6& 4.6     67/69
```

```
RUN# 124    DATE:  4/ 8/74    COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET       TIME       WINDSPEED    WIND DIR.     DRY BULB TEMP & DIFF     RELAT
 #                          SODIUM   START/END     START/END   START/END          START/END            HUMID

  3   5.13   0    207.9      326.5    933/1223     14.6/18.0      8/ 7      24.0& 5.8/25.5& 4.7       57/66
  4   9.74   0    202.7      604.5    945/1229     16.6/14.8      8/ 7      25.0& 5.5/26.0& 4.5       60/68
  5   5.60   0    187.5      321.5   1023/1242     12.8/10.8      8/ 8      26.0& 5.9/26.0& 6.0       58/58
  6   5.65   0    220.4      381.5   1124/1343     13.6/15.1      7/ 6      26.0& 6.0/27.3& 5.5       58/62
  7   7.56   0    239.3      553.5    955/1235     10.8/14.9      7/ 8      24.5& 5.9/26.0& 5.1       57/64
  8   5.88   0    192.7      346.5   1037/1251     10.0/ 8.8      9/ 8      25.9& 5.1/25.6& 5.7       63/59
  9   5.05   0    220.9      341.5   1112/1328     10.5/10.6      6/ 7      26.4& 6.9/25.3& 6.3       52/55
 10   5.47   0    186.1      311.5   1135/1348     11.9/16.4      7/ 7      27.4& 5.9/27.3& 6.3       60/57
```

```
RUN# 125    DATE:  4/ 9/74    COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET       TIME       WINDSPEED    WIND DIR.     DRY BULB TEMP & DIFF     RELAT
 #                          SODIUM   START/END     START/END   START/END          START/END            HUMID

  3   3.67   0    277.2      311.5   1112/1410      4.8/14.8     14/11      26.0& 5.9/29.6& 5.6       58/63
  4   4.26   0    271.0      353.5   1122/1418      3.5/20.7     15/10      25.8& 5.8/28.5& 5.0       59/66
  5   3.36   0    264.2      271.5   1142/1430     11.5/20.6     13/11      27.0& 5.8/28.6& 6.1       60/59
  6   3.04   0    216.8      201.5   1311/1527     11.0/17.3     10/11      27.9& 6.7/28.5& 5.5       56/63
  7   2.84   0    283.3      246.5   1131/1424      5.5/13.3     15/11      25.6& 5.6/28.2& 6.2       60/59
  8   3.06   0    241.5      226.5   1155/1438      9.5/16.9     14/11      26.1& 5.8/29.2& 7.0       59/54
  9   2.80   0    213.8      183.5   1254/1535     10.9/14.6     10/11      28.5& 6.9/28.0& 6.0       55/60
 10   2.66   0    173.5      141.5   1325/1521     17.8/17.6     10/11      28.1& 6.7/29.6& 6.6       56/57
```

```
RUN# 126   DATE:  4/10/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM   START/END    START/END   START/END        START/END           HUMID

 3    9.05   0    163.7      453.5    1143/1525    16.6/20.2      3/ 3     23.6& 4.4/26.0& 4.1     66/70
 4    8.09   0    261.9      648.5    1208/1533     6.8/13.2      4/ 4     26.0& 4.8/26.8& 5.3     66/63
 5   10.41   0    181.6      578.5    1320/1545    11.4/17.9      3/ 3     27.6& 4.8/26.9& 5.9     67/59
 6    6.55   0    245.0      491.5    1358/1628    13.0/20.8      4/ 3     27.0& 5.8/26.7& 5.8     60/59
 7    7.77   0    340.1      808.5    1215/1538    14.2/17.1      2/ 4     24.8& 4.3/25.9& 5.1     68/63
 8   10.61   0    262.7      853.5    1311/1553    19.1/23.5      8/ 4     26.2& 3.2/26.4& 3.5     77/74
 9    6.27   0    258.7      496.5    1345/1635    13.6/22.1      3/ 3     27.5& 5.3/26.8& 5.8     63/59
10    6.33   0    206.7      381.5    1412/1622    13.5/17.2      3/ 4     27.0& 5.3/26.9& 5.9     63/59
```

```
RUN# 127   DATE:  4/11/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM   START/END    START/END   START/END        START/END           HUMID

 3   27.69   0    169.0     1432.5    1206/1433    29.3/22.6      6/ 5     26.0& 4.3/26.8& 4.6     69/67
 4   25.39   0    211.2     1641.5    1216/1439    28.9/23.0      6/ 4     26.2& 4.2/27.6& 4.1     70/71
 5   20.92   0    191.8     1228.5    1303/1451    25.0/24.0      5/ 4     26.7& 3.7/27.0& 4.0     73/71
 6   19.75   0    176.4     1066.5    1359/1549    24.6/22.2      5/ 4     27.0& 4.7/26.5& 4.2     66/70
 7   19.32   0    188.8     1116.5    1227/1443    23.6/20.2      5/ 4     26.5& 3.7/27.0& 4.0     73/71
 8   17.51   0    167.3      896.5    1315/1500    27.7/24.0      5/ 5     26.7& 3.7/26.9& 3.9     73/72
 9   20.09   0    177.5     1091.5    1411/1556    24.8/18.7      4/ 4     27.0& 4.0/27.0& 4.0     71/71
10   18.27   0    175.0      978.5    1348/1540    21.0/19.3      4/ 4     27.9& 5.0/26.9& 4.6     66/67
```

```
RUN# 128   DATE:  4/16/74   COOLING DEVICE CODE=0

ST   PHI    C   VOLUME      NET      TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM   START/END    START/END   START/END        START/END           HUMID

 3   6.69   1   259.6     531.5   1111/1410     9.1/          10/ 9     28.6& 4.1/      &         72/
 4   5.36   1   201.9     331.5   1140/1355    18.1/           9/10     29.0& 4.0/      &         72/
 5   6.40   1   166.7     326.5   1218/1404    11.2/           9/ 9     27.0& 4.0/      &         71/
 7   4.93   1   206.6     311.5   1153/1400    14.2/           9/10     27.6& 4.6/      &         68/
 8   7.95   0   142.5     346.5   1241/1419     3.8/          11/10     25.3& 2.8/      &         79/
```

```
RUN# 129   DATE:  4/17/74   COOLING DEVICE CODE=0

ST   PHI    C   VOLUME      NET      TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM   START/END    START/END   START/END        START/END           HUMID

 3   1.60   0   270.1     132.3   1134/1458     4.4/19.1       4/ 7     26.7& 3.7/28.0& 3.5      73/75
 4   1.96   0   149.7      89.7   1218/1503     7.0/15.2       6/ 7     28.5& 3.6/28.0& 4.0      75/72
 5   1.47   0   254.8     114.3   1241/1514     7.7/18.1       6/ 8     27.8& 4.3/28.0& 4.4      70/70
 6   1.32   1   166.9      67.2   1356/1540    11.2/           8/16     28.0& 6.0/      &        60/
 7   1.28   0   250.7      98.3   1229/1509     8.2/13.4       6/ 7     27.0& 3.3/27.6& 3.8      76/73
 8   1.49   0   201.6      92.2   1303/1521    11.4/21.7       7/ 8     28.4& 4.1/27.9& 4.8      72/67
 9   0.81   2   140.4      34.8   1339/1543     9.0/           6/15     29.9& 5.9/      &        61/
10   1.17   1   132.3      47.2   1410/1536    13.7/           7/ 1     29.9& 6.9/      &        56/
```

```
RUN# 130   DATE:  4/18/74   COOLING DEVICE CODE=2

ST   PHI   C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                       SODIUM   START/END    START/END   START/END        START/END         HUMID

 3   7.07  0   261.7     566.5    1225/1511    19.3/18.2      3/ 4     26.2& 5.3/25.8& 5.4    62/61
 4   5.43  0   200.5     333.5    1235/1518    17.0/13.4      4/ 5     26.1& 5.4/25.8& 5.4    62/61
 5   4.57  0   279.9     391.5    1323/1532    18.4/16.6      4/ 4     25.8& 4.6/26.4& 5.8    67/59
 6   5.16  0   158.7     250.5    1428/1609    17.9/19.7      4/ 4     26.0& 5.2/25.7& 5.4    63/61
 7   5.88  5   107.5     193.5    1244/1524    19.8/16.9      3/ 4     26.8& 5.8/25.7& 5.4    59/61
 8   6.74  0   188.3     398.5    1339/1540    28.1/19.4      4/ 4     25.7& 4.9/26.9& 4.9    65/65
 9   6.04  0   159.9     295.5    1418/1603    21.7/16.7      5/ 3     26.2& 5.5/26.2& 5.6    61/60
10   4.93  0   141.4     213.5    1435/1613    11.7/17.3      3/ 4     26.4& 6.2/25.8& 5.7    57/59
11   5.94  0   222.0     403.5    1310/1528    15.4/13.6      3/ 3     26.3& 5.6/25.8& 5.2    60/63
```

Low RPM on Station 7.

```
RUN# 131   DATE:  4/19/74   COOLING DEVICE CODE=2

ST   PHI   C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                       SODIUM   START/END    START/END   START/END        START/END         HUMID

 3   5.43  0   248.4     412.5    1107/1406    15.0/19.3      4/ 4     25.5& 6.0/26.6& 6.2    57/57
 4   4.70  0   152.4     200.5    1150/1413    15.7/16.9      4/ 4     26.0& 5.5/26.0& 6.6    61/54
 5   6.10  0   137.9     257.5    1233/1428    15.4/13.6      5/ 5     27.2& 6.2/26.8& 7.0    58/52
 6   3.60  0   166.7     183.5    1321/1510    14.9/12.8      2/ 2     26.3& 6.4/26.2& 6.3    55/56
 7   4.67  0   156.4     223.5    1203/1419    15.5/20.2      3/ 3     26.2& 6.3/25.9& 6.3    56/55
 8   5.70  0   175.6     306.5    1245/1437    20.2/19.4      3/ 3     26.4& 5.4/26.1& 6.0    62/58
 9   3.79  5   126.3     146.5    1309/1502    18.2/16.9      3/ 3     27.1& 7.1/26.0& 6.4    52/55
10   3.26  0   163.9     163.5    1330/1515    12.7/11.8      3/ 3     27.0& 7.1/26.0& 7.0    52/51
11   4.23  0   195.8     253.5    1224/1423    13.6/17.6      4/ 4     26.9& 6.6/26.0& 6.8    55/52
```

Low RPM on Station 9.

```
RUN# 132   DATE:  4/20/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME      NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                         SODIUM   START/END    START/END   START/END       START/END          HUMID

 3  15.56   5    89.3      425.5    1210/1442    23.6/23.2      5/ 5     26.7& 4.9/26.9& 5.1    65/64
 4  31.46   0   128.9     1241.5    1247/1446    19.9/20.3      5/ 5     27.0& 5.8/26.5& 4.5    60/68
 5  40.03   0   120.1     1471.5    1318/1500    20.8/19.3      5/ 5     27.7& 4.9/26.7& 4.7    66/66
 6   8.22   0   151.5      381.5    1410/1542    22.9/21.1      4/ 4     25.7& 5.3/26.2& 6.2    62/56
 7  10.08   0   198.2      611.5    1251/1451    26.2/19.8      5/ 5     26.9& 5.7/25.4& 5.4    60/61
 8  10.81   0   159.8      528.5    1330/1507    27.3/27.8      5/ 4     26.7& 4.5/26.5& 5.2    68/63
 9   9.06   0   141.2      391.5    1422/1547    20.8/18.4      4/ 3     27.0& 5.9/27.5& 6.3    59/57
10   7.95   0   142.5      346.5    1400/1537    24.2/19.1      4/ 4     27.1& 6.1/28.0& 6.0    58/60
11  22.01   0   166.5     1121.5    1310/1455    20.9/18.0      6/ 6     27.0& 6.0/27.0& 6.0    58/58
```

Low RPM on Station 3.

```
RUN# 133   DATE:  4/22/74   COOLING DEVICE CODE=1

ST   PHI    C   VOLUME      NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                         SODIUM   START/END    START/END   START/END       START/END          HUMID

 3  20.09   0   273.5     1681.5     958/1257    23.8/18.2      6/ 6     25.7& 4.5/26.0& 4.0    67/71
 4  39.68   0   271.0     3291.5    1010/1301    21.3/19.6      6/ 6     26.0& 4.3/26.6& 3.7    69/73
 5  23.47   0   209.0     1501.5    1049/1315    24.8/19.1      7/ 7     27.0& 4.1/27.5& 3.7    70/73
 6  15.07   0   232.2     1071.5    1127/1349    19.2/18.3      6/ 6     26.5& 4.6/28.0& 5.0    67/66
 7  18.22   0   269.3     1501.5    1019/1306    16.7/20.0      6/ 6     25.7& 4.5/25.4& 4.2    67/69
 8  19.21   0   184.0     1081.5    1058/1322    23.2/25.2      6/ 6     26.4& 4.6/27.0& 3.7    67/73
 9  15.36   0   234.3     1101.5    1137/1415    23.3/15.2      6/ 6     27.2& 5.3/28.0& 4.3    63/70
10  14.52   0   203.2      903.5    1117/1345    15.7/20.8      5/ 5     26.1& 4.9/27.0& 5.0    65/65
11  22.00   0   212.5     1431.5    1038/1310    23.8/18.6      7/ 6     26.3& 4.3/27.0& 4.0    69/71
```

```
RUN# 134   DATE:  4/23/74   COOLING DEVICE CODE=1

ST   PHI    C   VOLUME    NET      TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM   START/END   START/END   START/END        START/END          HUMID

 3  12.78   0   117.2    458.5   1022/1243   19.5/17.8      8/ 9    27.1& 3.6/28.0& 4.4     74/70
 4  12.73   0   139.0    541.5   1037/1248   19.0/18.2      8/ 8    27.6& 4.1/28.6& 3.9     71/73
 5  11.89   0   152.0    553.5   1117/1303   19.1/13.6      8/ 8    28.0& 4.5/29.5& 5.3     69/65
 6   9.32   0   189.9    541.5   1156/1353   13.3/14.3      9/ 9    27.6& 4.6/28.7& 4.8     68/67
 7  12.34   0   190.8    703.5   1043/1253   18.8/13.8      8/ 8    27.0& 4.1/28.4& 5.1     70/65
 8  13.27   0   156.4    491.5   1123/1308   19.0/13.9      8/ 8    28.0& 4.4/29.9& 4.9     70/67
 9   9.32   0   152.4    503.5   1212/1418   12.0/ 9.5      7/ 7    28.7& 5.4/29.0& 5.3     63/64
10   8.98   0   122.4    336.5   1147/1358   14.2/15.7      7/ 7    29.0& 5.3/29.4& 5.7     64/62
11  10.59   0   183.7    611.5   1107/1259   21.3/15.3      8/ 8    27.0& 3.0/28.0& 4.0     78/72
```

```
RUN# 135   DATE:  4/24/74   COOLING DEVICE CODE=1

ST   PHI    C   VOLUME    NET      TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM   START/END   START/END   START/END        START/END          HUMID

 3   3.30   0   160.5    191.5   1017/1251    9.6/ 4.7     15/ 4    27.0& 4.0/27.8& 4.6     71/68
 4   4.26   0   204.4    256.5   1035/1255    2.8/ 2.4     15/16    26.0& 3.1/28.9& 6.6     77/56
 5   5.83   0   137.7    245.5   1115/1316    8.8/ 4.1      1/ 1    27.0& 4.0/28.6& 4.8     71/67
 6   3.39   0   189.2    196.5   1154/1354    3.0/ 9.7      9/ 9    28.0& 5.8/28.6& 5.4     61/63
 7   2.01   5    81.5     75.2   1040/1303    4.6/ 6.1     15/15    28.0& 5.0/28.8& 5.4     66/63
 8   3.56   0   157.5    171.5   1127/1324    9.1/ 8.1      1/ 1    28.0& 5.0/28.0& 4.5     66/69
 9   3.98   0   194.3    236.5   1203/1407   12.3/ 9.1     14/14    29.0& 6.0/28.0& 4.9     60/67
10   3.06   0   161.5    151.5   1145/1349   12.8/10.9     14/14    27.6& 5.4/28.0& 5.6     63/62
11   4.00   0   197.9    242.5   1107/1312    4.4/ 7.1     15/15    27.0& 4.8/29.0& 5.7     66/61
```

Low RPM on Station 7.

```
RUN# 136   DATE:  4/25/74   COOLING DEVICE CODE=1

ST    PHI    C   VOLUME     NET       TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
#                          SODIUM   START/END   START/END   START/END       START/END          HUMID

 3  17.27   0   242.4    1281.5   1034/1302   26.6/20.4     4/ 4     25.1& 4.7/25.1& 4.6    65/66
 4  13.40   0   220.2     903.5   1048/1308   17.5/15.2     4/ 4     25.3& 5.0/25.7& 4.9    64/65
 5  10.78   0   262.5     866.5   1140/1330   18.7/24.8     5/ 5     25.8& 5.1/25.9& 5.3    63/62
 6  12.04   0   182.7     673.5   1226/1418   17.8/14.9     3/ 3     25.1& 4.7/27.2& 5.6    65/61
 7  14.15   0   231.3    1001.5   1102/1316   20.8/25.7     3/ 3     25.4& 5.1/25.1& 4.7    63/65
 8  18.30   0   152.4     853.5   1153/1339   37.1/28.2     4/ 3     25.7& 4.4/25.5& 4.4    68/68
 9  14.21   0   171.6     746.5   1240/1428   25.1/18.2     2/ 2     25.2& 5.0/26.0& 5.0    63/64
10  12.53   0   144.4     553.5   1215/1413   19.5/21.7     2/ 2     25.7& 5.2/27.0& 5.8    63/60
11  13.85   0   177.8     753.5   1120/1323   13.7/16.6     4/ 4     25.7& 5.0/25.7& 4.7    64/66
```

```
RUN# 137   DATE:  4/26/74   COOLING DEVICE CODE=1

ST    PHI    C   VOLUME     NET       TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
#                          SODIUM   START/END   START/END   START/END       START/END          HUMID

 3  10.42   0   212.7     678.5   1026/1319   13.5/16.0     5/ 5     23.5& 6.5/24.8& 5.8    52/58
 4   8.91   0   150.5     410.5   1037/1328   11.1/14.3     3/ 3     24.6& 6.6/25.6& 6.7    52/53
 5   9.43   0   230.9     666.5   1118/1341   10.6/15.5     4/ 4     26.0& 7.0/26.0& 7.1    51/50
 6   8.02   0   200.2     491.5   1154/1410   12.1/15.0     3/ 4     25.6& 6.7/26.1& 6.3    53/56
 7   8.74   0   113.5     303.5   1049/1332   15.7/15.1     3/ 3     23.6& 6.4/25.0& 6.5    53/53
 8  10.20   0   219.5     685.5   1128/1347   13.3/16.7     3/ 3     24.9& 5.9/25.6& 5.6    57/60
 9   7.94   0   186.5     453.5   1206/1416   14.4/17.0     3/ 3     26.5& 7.5/26.5& 7.7    49/48
10   6.60   0   137.8     278.5   1149/1405   11.2/12.8     3/ 2     25.2& 6.3/26.9& 7.9    55/48
11   9.14   0   247.2     691.5   1107/1337   11.5/12.6     3/ 3     25.3& 6.6/25.8& 7.0    53/51
```

```
RUN# 138    DATE:  4/28/74    COOLING DEVICE CODE=2

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF    RELAT
#                           SODIUM    START/END    START/END    START/END        START/END           HUMID

 3   11.77   0    129.5      466.5    1032/1302    19.5/16.1       5/ 5     25.8& 7.6/26.3& 6.1     47/57
 4   20.57   0    163.9     1031.5    1044/1306    17.8/16.7       5/ 5     25.8& 7.6/25.9& 6.9     47/52
 5   23.19   0     90.4      641.5    1110/1326    18.5/16.9       5/ 6     26.0& 7.1/26.0& 6.2     50/56
 6   12.58   0    234.7      903.5    1148/1412    17.2/17.9       5/ 5     26.8& 6.5/27.2& 7.2     55/52
 7   14.33   5     35.7      156.5    1052/1316    19.6/19.5       5/ 5     25.4& 7.2/24.8& 5.8     49/58
 8   14.03   0    139.1      597.5    1122/1333    22.7/23.9       5/ 6     26.0& 6.0/26.0& 5.5     58/61
 9   11.38   0    229.0      797.5    1155/1418    17.8/19.4       3/ 4     27.0& 6.2/27.0& 6.8     57/54
10    9.88   0    183.0      553.5    1140/1407    19.4/15.8       4/ 4     26.0& 5.8/26.2& 7.2     59/50
11   22.62   5     63.8      441.5    1102/1322    15.0/17.8       5/ 5     26.5& 7.5/26.0& 6.8     49/52
```

Low RPM on Stations 7 and 11.

```
RUN# 139    DATE:  4/29/74    COOLING DEVICE CODE=2

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF    RELAT
#                           SODIUM    START/END    START/END    START/END        START/END           HUMID

 3    6.08   0    186.8      347.5    1022/1230    14.4/13.8       4/ 5     25.2& 6.2/26.7& 6.9     55/53
 4   22.12   0    184.8     1251.5    1032/1235    16.8/10.4       5/ 5     25.6& 6.8/27.1& 7.0     52/53
 5   13.77   0    152.2      641.5    1109/1256    10.6/15.7       4/ 4     26.9& 7.3/27.2& 6.8     51/54
 6    6.00   0    131.5      241.5    1145/1328    11.6/ 9.2       5/ 5     27.0& 6.7/28.1& 7.8     54/49
 7    5.20   0    198.8      316.5    1040/1243    12.6/12.6       4/ 4     25.8& 6.8/26.4& 6.5     52/55
 8    5.35   0    156.7      256.5    1119/1304    13.7/12.6       4/ 4     26.2& 5.7/27.3& 6.8     60/54
 9    5.11   0    157.7      246.5    1153/1336    14.4/10.5       4/ 4     27.0& 6.8/29.0& 7.9     54/49
10    3.85   0     93.7      110.5    1137/1323    13.8/ 9.8       4/ 4     27.0& 7.1/27.0& 7.2     52/52
11   13.20   0    143.2      578.5    1102/1250     9.2/10.0       4/ 4     26.1& 6.9/28.0& 7.0     52/54
```

```
RUN# 140   DATE:  4/29/74   COOLING DEVICE CODE=2

ST    PHI   C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                        SODIUM   START/END    START/END   START/END       START/END          HUMID

 3   5.95   0   160.0     291.5   1233/1426   13.8/17.1      5/ 4     26.7& 6.9/27.0& 7.1     53/52
 4  23.65   0   156.3    1131.5   1240/1429   10.4/10.2      5/ 4     27.1& 7.0/27.2& 7.2     53/52
 5   7.70   0   140.7     331.5   1259/1442   15.7/11.4      4/ 5     27.2& 6.8/28.0& 7.0     54/54
 6   5.04   0   104.7     161.5   1331/1529    9.2/13.9      5/ 3     28.1& 7.8/26.8& 6.9     49/53
 7   5.98   0   172.9     316.5   1247/1434   12.6/13.3      4/ 4     26.4& 6.5/27.0& 6.9     55/53
 8   6.39   0   129.7     253.5   1307/1448   12.6/18.0      4/ 4     27.3& 6.8/27.0& 6.2     54/57
 9   5.90   0   172.1     310.5   1330/1536   10.5/15.0      4/ 3     29.0& 7.9/25.3& 5.8     49/58
10   4.40   0    74.7     100.5   1325/1523    9.8/11.3      4/ 4     27.0& 7.2/27.0& 7.2     52/52
11  15.27   0   101.1     472.5   1254/1437   10.0/10.4      4/ 4     28.0& 7.0/27.7& 7.5     54/51



RUN# 141   DATE:  4/30/74   COOLING DEVICE CODE=2

ST    PHI   C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                        SODIUM   START/END    START/END   START/END       START/END          HUMID

 3   2.20   0   130.1      87.7   1037/1257    8.1/11.3      8/ 4     25.5& 6.3/27.0& 7.2     55/52
 4  27.27   0   126.0    1051.5   1050/1301    7.9/ 8.9      8/ 5     26.0& 6.0/26.8& 7.3     58/51
 5   6.56   0   183.5     368.5   1122/1315    5.4/ 8.2      8/ 6     26.0& 7.1/27.3& 7.3     50/51
 6   2.17   0   133.8      88.7   1157/1347   11.0/ 9.6      5/ 3     26.7& 7.1/27.0& 7.4     52/51
 7   2.21   0   114.8      77.7   1057/1306    6.4/10.7      6/ 3     25.3& 6.8/26.8& 7.8     52/48
 8   2.89   0   162.5     143.5   1132/1322   11.8/ 9.7      4/ 3     25.8& 6.6/27.2& 6.6     53/55
 9   2.05   0   145.6      91.5   1206/1353    6.3/13.6      4/ 3     27.6& 7.4/27.0& 7.8     51/48
10   1.77   0    99.7      53.9   1143/1342    5.9/ 6.4      5/ 4     26.0& 7.0/27.9& 7.9     51/49
11  10.42   0   187.4     597.5   1115/1310    7.7/ 7.1      7/ 5     25.7& 6.5/27.1& 7.1     54/52
```

```
RUN# 142   DATE:  5/ 1/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME     NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                         SODIUM    START/END   START/END   START/END        START/END          HUMID

 3    2.16  0   137.5       91.0    1013/1307    8.0/13.6     11/ 7    26.0& 5.2/26.9& 5.7     63/60
 4   39.52  0   140.1     1767.3    1023/1316    1.5/11.6     16/ 6    26.7& 6.2/27.6& 6.4     57/57
 5    6.04  5    95.3      177.3    1102/1332    5.2/ 9.4     13/ 6    27.0& 6.6/28.6& 6.5     55/57
 6    2.61  0   234.7      187.3    1139/1406    8.0/13.3      6/ 7    28.0& 6.9/28.6& 6.8     55/55
 7    2.50  0   258.6      202.3    1033/1322   12.3/14.2      9/ 7    26.5& 6.0/26.7& 6.1     58/58
 8    3.30  0   129.3      134.3    1113/1339    9.2/12.7      8/ 8    27.2& 6.8/28.1& 6.8     54/55
 9    2.52  0   238.5      184.3    1143/1412    2.2/10.4     10/ 7    29.1& 7.8/28.2& 6.9     50/55
10    2.09  0   150.9      100.3    1130/1401    4.2/11.5     11/ 6    28.1& 7.1/28.0& 6.9     53/55
11   19.57  0   127.9      766.3    1053/1326    2.6/13.2     12/ 8    27.2& 6.1/27.2& 5.2     58/64
```

Low RPM on Station 5.

```
RUN# 143   DATE:  5/ 2/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME     NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                         SODIUM    START/END   START/END   START/END        START/END          HUMID

 3    1.56  0   235.8      112.3    1019/1300   14.3/14.3      9/ 7    27.0& 4.4/25.7& 4.2     68/69
 4    3.46  0   239.4      253.3    1034/1305   12.6/12.2      9/ 9    26.7& 5.1/27.1& 5.1     64/64
 5    1.41  0   179.6       77.3    1118/1324   14.2/ 5.7      7/ 9    28.5& 5.5/26.0& 5.2     63/63
 6    1.09  5    74.7       24.8    1157/1400    9.7/12.0     10/ 8    28.0& 6.4/28.8& 7.0     58/54
 7   10.15  0   252.8      785.3    1040/1310    7.8/10.0      8/ 8    26.8& 5.7/27.0& 5.9     60/59
 8    1.33  0    97.5       39.8    1127/1333   10.4/11.5      8/10    27.9& 5.7/28.3& 6.4     62/58
 9    0.93  5    82.7       23.6    1206/1406   11.8/ 9.4      8/ 8    29.1& 6.8/29.2& 7.6     55/51
10    1.57  5    78.8       37.8    1148/1354   11.8/ 6.7      8/ 8    29.0& 6.5/28.6& 6.7     57/56
11    1.22  5    96.7       36.1    1110/1315   17.5/14.0     10/ 8    27.0& 4.5/27.4& 4.6     68/68
```

Low RPM on Stations 6, 9, 10, and 11.

```
RUN# 144   DATE:  5/ 3/74   COOLING DEVICE CODE=2

ST    PHI   C   VOLUME      NET       TIME       WINDSPEED    WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                         SODIUM   START/END    START/END    START/END        START/END          HUMID

 3    1.68  0   345.8      177.3    1038/1440    12.4/20.2       8/ 9     28.1& 5.8/29.6& 6.4     61/58
 4    1.78  0   326.1      177.3    1057/1444    12.2/16.6       8/ 6     27.9& 5.7/29.1& 7.1     62/54
 5    1.70  0   255.8      133.3    1122/1456     6.5/15.3       9/ 7     29.6& 7.2/30.3& 7.3     54/54
 6    1.47  0   302.6      136.3    1215/1526    14.7/12.5      10/ 8     28.0& 6.8/29.1& 6.7     55/56
 7    2.77  0   337.0      285.3    1105/1449    10.4/12.0      10/ 7     28.0& 5.7/29.3& 7.5     62/52
 8    2.02  0   313.0      193.3    1132/1503    13.6/17.4       7/ 8     28.5& 6.2/29.4& 7.4     59/52
 9    1.36  0   310.0      129.3    1213/1532     7.6/ 9.6       7/ 8     30.2& 7.7/31.0& 8.1     52/51
10    1.48  0   221.7      100.3    1107/1522     9.1/10.5       7/ 7     30.0& 7.0/31.0& 8.4     55/49
11    1.51  0   172.3       79.8    1115/1452    14.8/16.9      10/ 9     28.0& 5.8/29.1& 6.1     61/59
```

```
RUN# 145   DATE:  5/ 4/74   COOLING DEVICE CODE=2

ST    PHI   C   VOLUME      NET       TIME       WINDSPEED    WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                         SODIUM   START/END    START/END    START/END        START/END          HUMID

 3    2.59  0   231.2      183.5     808/1050     3.3/ 4.5      16/12     20.0& 2.2/27.3& 5.4     81/62
 4    0.87  0   220.8       59.0     823/1056     3.6/ 4.4      16/10     20.2& 2.1/27.8& 5.7     82/61
 5    0.96  0   205.3       60.3     911/1118     4.1/ 4.6      14/10     22.1& 2.6/28.0& 6.8     78/55
 6    0.72  0   185.8       40.9    1000/1202     4.5/ 8.6      14/ 8     24.3& 3.3/29.0& 7.7     74/50
 7    0.68  0   235.2       49.0     836/1103     4.1/ 3.5       1/ 9     21.0& 2.2/27.5& 6.3     81/57
 8    0.64  0   177.2       34.6     927/1128     5.1/ 4.4       1/ 7     22.7& 2.7/28.0& 6.7     78/56
 9    0.72  0   174.7       38.4    1011/1212     4.3/ 7.0       3/ 5     25.0& 4.0/29.5& 7.8     70/51
10    0.64  0   164.4       32.1     949/1155     3.8/10.0       1/ 8     23.7& 2.9/28.8& 7.6     77/51
11    0.76  0   207.6       48.4     859/1111     5.8/ 3.7      16/12     22.0& 2.8/27.5& 5.8     77/60
```

```
RUN# 146   DATE:  5/ 6/74   COOLING DEVICE CODE=1

ST   PHI    C    VOLUME      NET       TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                          SODIUM   START/END    START/END   START/END        START/END           HUMID

 3   2.53   0    205.4      162.5    1012/1258    14.7/19.6      8/ 8     26.5& 3.3/31.1& 5.1      77/66
 4   2.87   0    212.4      186.5    1024/1304    12.0/21.2      8/ 9     28.8& 3.8/31.1& 5.2      74/66
 5   2.85   0    223.0      194.5    1113/1322     9.3/13.2      8/ 9     30.0& 4.9/32.0& 8.5      68/48
 6   1.62   0    186.2       92.5    1237/1401    11.4/11.9      8/10     30.9& 5.3/32.6& 8.4      65/50
 7   2.41   0    263.3      194.5    1035/1310     9.6/16.0      8/ 9     29.0& 4.8/31.7& 7.1      67/56
 8   2.36   0    194.6      140.5    1125/1329    12.5/20.2      9/ 9     30.7& 4.8/32.0& 8.0      68/51
 9   1.71   0    189.4       98.5    1155/1351    10.4/13.4      9/ 9     28.3& 4.0/32.4& 8.0      72/52
10   1.37   0    134.3       56.5    1219/1405    14.5/12.5      9/ 9     31.4& 5.7/32.5& 8.4      63/50
11   2.40   0    237.1      174.5    1053/1316     8.9/17.9     10/11     29.2& 4.4/31.0& 6.5      70/59
```

```
RUN# 147   DATE:  5/ 7/74   COOLING DEVICE CODE=1

ST   PHI    C    VOLUME      NET       TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                          SODIUM   START/END    START/END   START/END        START/END           HUMID

 3   2.09   0    225.8      144.5     920/1220     6.8/10.8      2/ 4     24.8& 2.8/27.8& 4.6      78/68
 4   2.28   0    266.2      185.5     930/1224     2.6/ 7.4      8/ 3     25.8& 3.8/28.2& 4.5      72/69
 5   2.03   0    250.5      155.5    1005/1239     1.7/ 5.5     15/ 4     26.0& 3.7/29.0& 4.7      73/68
 6   1.83   0    223.8      125.5    1045/1310     3.3/ 6.7     12/ 9     26.5& 4.2/29.3& 5.4      70/64
 7   1.74   0    273.6      145.5     940/1229     2.5/ 7.8     16/ 4     26.0& 3.7/28.0& 4.5      73/69
 8   2.53   0    222.5      172.5    1016/1246     7.2/ 7.1     14/ 5     25.8& 3.6/28.1& 3.7      74/74
 9   2.29   0    221.8      154.5    1059/1316     6.0/ 3.3     10/ 4     25.6& 3.6/30.4& 6.4      73/59
10   1.65   0    196.8       99.5    1035/1303     0.5/ 6.5     16/ 4     26.0& 4.9/29.1& 5.2      65/65
11   2.07   0    229.1      145.5     953/1234     1.3/ 5.8     12/ 4     25.5& 3.5/28.1& 4.9      74/67
```

```
RUN# 148   DATE:  5/ 8/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM    START/END    START/END    START/END         START/END          HUMID

 3    1.39   0    261.3      159.5      924/1220     6.8/14.7       8/ 6      26.8& 3.8/29.0& 4.0      72/72
 4   12.61   0    266.7     1029.5      935/1224    12.7/14.0       8/ 7      28.6& 4.0/30.0& 4.2      72/72
 5    2.17   0    245.8      163.5     1037/1238     8.8/10.9       7/ 6      28.8& 4.8/30.6& 5.7      67/63
 6    1.84   0    234.6      134.5     1049/1322    10.0/           6/ 6      28.7& 4.7/     &         68/
 7    1.93   0    271.9      160.5      943/1229     9.1/11.3       7/ 7      28.0& 4.7/30.0& 5.5      68/64
 8    2.20   0    208.8      140.5     1019/1245    12.8/13.9       6/ 7      28.1& 4.1/28.3& 4.2      71/71
 9    1.59   0    266.3      129.5     1039/1326    10.1/           6/ 6      28.8& 4.8/     &         67/
10    1.45   0    159.4       71.5     1056/1318     6.5/           7/ 6      29.3& 4.4/     &         70/
11    3.94   0    252.3      304.5     1030/1233    15.3/13.6       7/ 7      28.3& 3.8/29.6& 4.8      73/68
```

```
RUN# 149   DATE:  5/ 9/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM    START/END    START/END    START/END         START/END          HUMID

 3    2.14   0    254.3      166.5     1001/1257     1.4/12.3      16/ 4      26.1& 3.7/26.9& 3.9      73/72
 4    2.12   0    280.0      181.5     1010/1302     1.7/10.1      15/ 4      26.0& 3.7/28.0& 4.8      73/67
 5    2.03   0    252.1      156.5     1043/1318     4.4/13.1      12/ 3      25.9& 3.9/28.2& 4.6      72/68
 6    1.68   0    235.8      121.5     1123/1353     3.0/13.3      15/ 4      28.1& 5.8/28.4& 5.3      61/64
 7    1.86   0    249.0      141.5     1013/1307     0.5/11.6      10/ 4      26.9& 4.6/27.8& 4.7      67/68
 8    1.98   0    225.3      136.5     1052/1325     3.8/13.7       5/ 3      26.4& 4.2/28.5& 4.3      70/70
 9    1.90   0    231.8      134.5     1115/1346     3.3/13.6       5/ 3      26.9& 4.8/29.3& 5.3      66/64
10    1.60   0    175.6       86.0     1132/1358     5.9/12.1       1/ 3      27.2& 4.9/28.9& 5.9      65/60
11    1.98   0    258.3      156.5     1035/1312     2.9/12.4       1/ 5      28.0& 5.1/28.8& 5.0      65/66
```

```
RUN# 150   DATE:  5/10/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET       TIME      WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                          SODIUM   START/END    START/END   START/END       START/END             HUMID

 3    1.51   0    284.9     131.5     937/1243    12.7/11.2      7/ 6      27.6& 4.0/28.1& 4.1      72/71
 4   10.06   0    297.5     916.5     945/1248     8.6/13.7      8/ 6      28.2& 4.1/28.5& 5.5      72/63
 5    1.21   0    274.3     101.5    1020/1302    16.0/16.8      5/ 6      28.7& 3.8/29.1& 4.1      74/72
 6    1.27   0    235.5      91.5    1107/1337    12.1/11.5      8/ 7      28.6& 4.3/29.3& 4.7      70/68
 7    1.27   0    274.6     106.5     953/1252    15.6/16.7      6/ 5      27.0& 4.1/28.2& 4.4      70/70
 8    1.28   0    213.8      84.0    1032/1310    12.7/10.5      7/ 6      28.2& 4.3/28.6& 4.4      70/70
 9    1.12   0    239.9      82.0    1056/1331    12.1/ 9.5      6/ 5      28.2& 4.4/29.8& 5.6      70/63
10    0.88   0    168.9      45.5    1115/1341    13.2/10.5      6/ 6      28.9& 5.5/29.5& 5.2      63/65
11    2.19   0    278.6     186.5    1012/1257    11.9/11.8      9/ 9      27.9& 4.0/28.6& 4.2      72/71
```

```
RUN# 151   DATE:  5/11/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET       TIME      WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                          SODIUM   START/END    START/END   START/END       START/END             HUMID

 3    7.09   0    332.6     721.5     829/1146    30.9/29.2      8/ 8      26.7& 3.7/28.8& 3.8      73/74
 4    8.63   0    320.4     846.5     842/1152    29.0/21.9      7/ 8      27.3& 3.1/29.0& 3.4      77/76
 5    8.09   0    293.3     726.5     933/1215    22.8/23.0      7/ 6      27.7& 2.7/30.0& 4.2      80/72
 6    6.88   0    259.5     546.5    1015/1254    21.2/20.0      7/ 7      27.8& 3.2/29.9& 4.6      77/69
 7   10.07   0    306.9     946.5     855/1158    23.0/26.5      7/ 7      27.0& 3.7/28.0& 3.3      73/76
 8    8.56   0    250.7     656.5     944/1224    28.6/26.8      7/ 8      28.0& 2.9/29.1& 3.8      79/74
 9    7.12   0    257.6     561.5    1026/1302    16.3/24.0      7/ 7      29.0& 2.8/30.0& 4.8      80/68
10    6.34   0    169.7     329.5    1004/1246    22.5/21.3      7/ 6      28.2& 2.9/30.0& 4.9      79/68
11    0.11   0    292.7       9.5     921/1108    26.1/22.1      9/ 8      27.6& 3.4/28.8& 3.1      76/78
```

```
RUN# 152   DATE:  5/13/74   COOLING DEVICE CODE=2

ST   PHI   C   VOLUME     NET       TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                       SODIUM  START/END   START/END   START/END       START/END          HUMID

 3   1.89  0   331.7     191.5   1054/1430   14.2/15.9      2/ 5     28.5& 5.8/28.7& 4.1    61/72
 4   4.40  0   229.7     309.5   1105/1440   11.3/15.4      3/ 5     28.9& 6.7/28.6& 4.6    56/68
 5   6.68  0   316.1     646.5   1210/1516    9.0/ 9.7      4/ 4     29.5& 4.6/29.0& 3.7    69/74
 6   4.03  0   287.4     354.5   1246/1545   10.8/14.2      4/ 5     29.0& 5.2/28.2& 3.9    65/73
 7   1.37  0   220.4      92.5   1123/1446   14.3/13.9      3/ 5     28.4& 5.8/29.2& 4.3    61/70
 8   1.90  0   285.9     166.5   1156/1508   14.4/17.9      3/ 6     29.0& 4.3/28.8& 3.9    70/73
 9   2.08  0   308.3     196.5   1235/1554    9.7/12.4      2/ 3     29.1& 5.1/29.9& 5.0    65/67
10   1.77  0   187.3     101.5   1257/1539    7.6/ 9.3      4/ 4     29.2& 5.0/29.3& 5.0    66/66
11   6.29  0   317.4     611.5   1143/1454   10.9/14.6      3/ 5     28.8& 5.4/28.9& 4.9    63/66
```

```
RUN# 153   DATE:  5/14/74   COOLING DEVICE CODE=2

ST   PHI   C   VOLUME     NET       TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                       SODIUM  START/END   START/END   START/END       START/END          HUMID

 3   5.77  0   264.2     466.5    907/1236   19.0/17.1      7/ 7     27.9& 3.0/29.7& 3.7    78/75
 4   7.60  0   288.6     671.5    918/1240   18.7/16.6      6/ 7     28.0& 2.4/30.3& 3.4    82/77
 5   3.77  0   290.1     334.5   1000/1252   16.4/16.1      6/ 6     28.4& 2.6/30.9& 3.9    81/74
 6   3.39  0   261.5     271.5   1043/1327   10.8/14.4      6/ 6     30.8& 4.5/31.0& 4.5    70/70
 7   9.19  0   317.0     891.5    927/1244   15.5/18.0      5/ 7     27.3& 3.2/29.0& 3.9    77/73
 8   3.27  0   236.3     236.5   1010/1258   19.6/20.8      6/ 7     28.1& 3.2/29.5& 3.2    77/78
 9   3.07  0   267.5     251.5   1034/1321   12.8/ 8.2      5/ 6     29.8& 4.7/32.0& 5.0    69/68
10   4.54  0   191.9     266.5   1051/1332   14.9/14.3      7/ 6     29.6& 4.4/31.4& 4.9    70/68
11   4.27  0   291.9     381.5    953/1248   17.2/16.4      8/ 8     27.9& 2.9/29.4& 2.7    79/81
```

```
RUN# 154   DATE:  5/15/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME      NET      TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                        SODIUM   START/END    START/END   START/END        START/END            HUMID

 3   8.13   1   340.1      846.5   1039/1423    18.1/16.1     8/ 8      29.8& 2.8/28.1& 3.1      81/78
 5   7.04   1   187.8      404.5   1248/1450    15.4/11.1     5/ 7      29.8& 2.6/28.2& 2.5      82/82
 7  11.29   1   285.5      986.5   1140/1435    12.1/10.4     3/ 7      29.1& 3.8/28.2& 3.2      74/77
 8   6.88   1   220.3      396.5   1235/1500    14.2/16.7     7/ 8      28.9& 3.6/28.2& 2.6      75/81
11   7.27   1   237.9      529.5   1220/1443    19.2/19.7     8/ 9      29.4& 2.6/30.0& 3.5      82/76


RUN# 155   DATE:  5/16/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME      NET      TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                        SODIUM   START/END    START/END   START/END        START/END            HUMID

 3   6.93   0   340.1      929.5   1111/1442    16.3/15.2     6/ 5      29.5& 3.6/30.2& 3.4      75/77
 4  67.61   0   252.9     5233.5   1123/1450    21.7/20.1     7/ 5      28.9& 3.1/30.1& 3.5      78/76
 5   8.23   0   351.8      886.5   1155/1517    17.5/22.0     6/ 4      29.7& 3.6/29.8& 3.4      75/77
 6  10.39   0   330.0     1049.5   1242/1606    18.5/19.7     6/ 5      30.0& 4.3/29.4& 4.2      71/71
 7   8.71   0   351.1      936.5   1129/1500    20.2/19.1     6/ 6      28.3& 4.1/29.1& 4.0      72/72
 8   7.81   0   328.8      786.5   1205/1527    21.5/23.5     5/ 5      29.2& 3.3/29.2& 3.3      77/77
 9   9.16   0   339.5      951.5   1233/1618    16.1/18.6     6/ 5      30.1& 4.3/29.7& 4.3      71/71
10   8.07   0   243.6      601.5   1250/1554    19.9/16.0     6/ 4      29.8& 4.8/30.7& 4.9      68/68
11   8.80   0   345.8      931.5   1147/1506    22.2/18.5     7/ 7      29.4& 3.4/29.7& 3.4      77/77
```

```
RUN# 156   DATE:  5/17/74   COOLING DEVICE CODE=2

ST    PHI    C   VOLUME      NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                         SODIUM   START/END    START/END   START/END        START/END           HUMID

 3    7.83   0   207.1      496.5    911/1152    19.7/15.7      7/ 6     27.1& 3.2/29.7& 4.4     76/70
 4   24.57   0   222.2     1671.5    918/1159    14.2/20.0      5/ 5     28.7& 3.0/29.0& 4.0     79/72
 5   19.64   0   252.3     1516.5    942/1216    23.5/17.1      5/ 4     28.8& 3.2/29.0& 3.2     78/78
 6   10.40   0   247.0      786.5   1032/1305    17.9/19.4      5/ 6     28.2& 4.4/28.6& 4.7     70/68
 7    7.49   0   272.1      656.5    925/1203    20.6/15.8      5/ 5     27.6& 4.4/28.4& 4.6     69/68
 8    7.50   0   230.7      529.5    957/1224    26.4/23.6      5/ 5     27.9& 3.9/28.9& 3.9     73/73
 9    7.46   0   276.7      631.5   1024/1310    19.8/15.4      5/ 6     28.6& 4.7/29.8& 5.2     68/66
10    6.37   0   182.9      339.5   1040/1257    14.4/15.7      5/ 5     28.7& 5.0/30.5& 6.0     66/61
11   52.64   0   266.4     4291.5    935/1209    19.8/21.1      7/ 7     28.1& 3.9/29.1& 3.7     73/74



RUN# 157   DATE:  5/20/74   COOLING DEVICE CODE=1

ST    PHI    C   VOLUME      NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                         SODIUM   START/END    START/END   START/END        START/END           HUMID

 3    8.65   0   322.5      853.5    847/1207    21.7/16.2      6/ 7     26.8& 2.5/29.3& 3.0     81/79
 4   11.12   0   327.7     1115.5    900/1213    22.7/17.0      6/ 6     27.1& 1.8/30.0& 2.7     86/81
 5   10.75   0   278.9      875.5    943/1238    21.5/19.7      5/ 5     28.0& 2.4/29.5& 2.5     82/83
 6    9.41   0   227.6      655.5   1038/1313    20.3/19.3      6/ 5     27.9& 3.2/29.6& 3.9     77/73
 7    7.79   0   316.3      753.5    912/1220    19.0/18.9      6/ 6     27.0& 2.7/29.0& 3.7     80/74
 8    9.91   0   252.4      765.5   1003/1242    24.4/22.3      6/ 6     27.8& 2.7/28.5& 3.0     80/79
 9    9.34   0   252.6      727.5   1040/1321    24.1/16.1      5/ 4     28.0& 3.2/28.9& 3.9     77/73
10    9.24   0   222.2      628.5   1027/1305    17.1/19.3      6/ 4     28.0& 3.2/29.0& 4.0     77/72
11   11.00   0   268.3      903.5    937/1226    18.5/19.4      7/ 7     28.0& 1.9/30.0& 2.8     86/81
```

```
RUN# 158   DATE:  5/21/74   COOLING DEVICE CODE=1

ST   PHI   C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                       SODIUM   START/END    START/END   START/END       START/END          HUMID

 3   9.45  0   284.0     335.5    839/1131     12.7/16.6     6/ 6    27.0& 2.0/28.5& 3.0    85/79
 4  16.35  0   211.7    1059.5    952/1137     15.2/20.6     6/ 5    27.8& 2.6/29.0& 3.5    81/76
 5   8.21  0   264.9     665.5    926/1157     27.6/16.3     4/ 5    28.5& 2.3/29.4& 2.5    83/83
 6   8.11  0   235.5     584.5   1010/1233     21.9/24.5     6/ 6    28.3& 3.3/28.0& 3.2    77/77
 7   9.34  0   276.5     790.5    903/1143     10.9/21.4     5/ 5    27.7& 3.2/28.9& 3.7    77/74
 8   3.47  0   243.7     258.5    937/1205     22.7/19.9     5/ 5    28.8& 2.7/29.0& 3.0    81/79
 9   4.81  0   214.3     315.5   1022/1242     22.4/18.0     5/ 5    28.3& 3.3/28.2& 3.2    77/77
10   7.19  0   192.5     423.5    957/1227     19.4/19.8     6/ 5    29.5& 4.2/29.2& 4.2    71/71
11  10.12  0   269.7     835.5    916/1150     18.9/19.4     6/ 6    28.0& 2.8/29.0& 2.7    80/81
```

```
RUN# 159   DATE:  5/22/74   COOLING DEVICE CODE=1

ST   PHI   C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                       SODIUM   START/END    START/END   START/END       START/END          HUMID

 3   4.87  0   232.9     347.5    850/1207     14.2/ 8.0     7/ 6    27.7& 3.0/27.8& 3.5    78/75
 4  16.52  0   234.0    1183.5    904/1212     18.9/13.5     7/ 6    27.5& 2.7/28.2& 3.2    80/77
 5   5.91  0   253.4     458.5    943/1231     10.5/12.1     5/ 5    28.0& 2.4/28.5& 3.3    82/77
 6   5.00  0   260.4     398.5   1031/1310     11.2/11.5     5/ 5    27.8& 3.7/29.0& 4.5    74/69
 7   5.13  0   296.7     465.5    916/1219     22.3/12.8     5/ 5    27.0& 3.0/28.0& 4.0    78/72
 8   5.40  0   251.3     415.5   1000/1239     17.6/15.4     5/ 5    28.0& 3.5/28.9& 4.1    75/72
 9   4.34  0   250.2     378.5   1041/1317     13.4/13.1     6/ 6    27.1& 3.2/28.4& 3.9    76/73
10   4.31  0   177.9     234.5   1020/1303     13.9/12.2     5/ 6    27.7& 3.7/29.6& 4.6    74/69
11   9.11  0   296.5     797.5    937/1225     15.0/10.5     7/ 7    27.9& 3.1/28.0& 3.1    78/78
```

RUN# 160 DATE: 5/23/74 COOLING DEVICE CODE=1

ST #	PHI	C	VOLUME	NET SODIUM	TIME START/END	WINDSPEED START/END	WIND DIR. START/END	DRY BULB TEMP & DIFF START/END	RELAT HUMID
3	3.37	0	300.7	310.5	942/1158	16.0/ 8.1	9/ 9	26.0& 3.2/29.0& 4.2	77/71
4	4.43	0	314.0	425.5	855/1204	12.9/10.3	9/ 8	28.0& 3.3/29.0& 4.9	76/66
5	3.27	0	267.9	268.5	945/1223	10.8/ 6.7	9/ 8	28.0& 4.0/28.0& 4.7	72/68
6	2.81	0	209.8	190.5	1032/1305	9.0/ 7.9	9/ 8	29.0& 5.5/29.9& 5.7	63/63
7	3.91	0	309.4	360.5	906/1210	12.3/ 7.4	9/ 8	27.2& 4.2/29.2& 5.5	70/63
8	2.87	0	215.4	189.5	953/1232	9.5/ 9.8	8/ 9	28.8& 5.0/30.0& 5.2	66/66
9	2.71	0	246.7	204.5	1021/1257	6.4/ 5.3	8/ 9	29.0& 5.2/30.1& 5.6	65/63
10	2.61	0	177.0	141.5	1043/1312	7.4/ 6.9	7/ 6	29.9& 5.7/30.4& 5.7	63/63
11	3.42	0	289.4	308.5	923/1216	11.1/ 8.0	9/10	28.1& 3.9/29.1& 5.6	73/62

RUN# 161 DATE: 5/24/74 COOLING DEVICE CODE=1

ST #	PHI	C	VOLUME	NET SODIUM	TIME START/END	WINDSPEED START/END	WIND DIR. START/END	DRY BULB TEMP & DIFF START/END	RELAT HUMID
3	2.06	0	220.9	139.5	1029/1257	8.5/12.4	10/ 8	28.0& 3.8/29.8& 4.8	73/68
4	4.46	0	179.9	245.5	1040/1303	5.7/ 9.8	10/ 7	28.7& 4.2/30.1& 3.6	71/76
5	2.41	0	221.4	163.5	1110/1322	6.1/ 7.3	8/ 6	29.0& 4.7/30.6& 5.4	68/65
6	2.14	0	178.0	116.5	1151/1356	5.0/ 5.6	8/ 8	29.2& 4.9/31.0& 6.0	67/61
7	2.93	0	228.0	204.5	1049/1309	7.1/ 6.8	9/ 8	28.8& 4.6/30.3& 5.3	68/65
8	2.20	0	184.7	127.5	1122/1330	5.3/ 7.7	8/ 8	29.2& 4.4/29.8& 4.8	70/68
9	2.10	0	193.3	124.5	1200/1404	6.4/ 8.1	9/ 8	29.5& 4.7/31.1& 6.2	68/60
10	2.04	0	154.4	96.5	1142/1350	4.7/ 5.8	8/ 8	29.0& 4.5/31.7& 6.6	69/59
11	2.32	0	224.6	159.5	1059/1316	8.0/ 6.8	9/ 9	28.7& 4.0/30.2& 5.1	72/66

```
RUN# 162   DATE:  5/27/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME     NET       TIME      WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM   START/END   START/END   START/END       START/END            HUMID

 3  17.68   0   239.4    1295.5    834/1148   14.4/17.7     11/12     29.0& 2.7/32.0& 6.7     81/58
 4   1.10   0   197.7      66.3    847/1154   12.4/13.1     11/12     29.2& 3.1/32.2& 7.4     78/55
 5   1.19   0   236.1      85.6    932/1213   10.8/ 9.4     11/11     30.0& 4.9/31.8& 7.0     68/57
 6   1.11   0   235.3      79.9   1017/1254   11.8/11.7     12/10     31.0& 6.2/33.2& 7.4     60/56
 7   1.14   0   294.8     102.5    953/1201    7.2/12.1     10/12     29.1& 3.9/33.0& 7.7     73/54
 8   1.08   0   240.9      79.9    945/1222   10.4/10.1     13/11     30.1& 5.1/32.5& 7.5     66/54
 9   1.06   0   252.4      81.6   1007/1247   13.8/11.8     12/ 9     31.0& 6.2/31.6& 6.8     60/57
10   1.01   0   186.5      57.4   1020/1303    9.0/15.1     12/11     31.9& 6.7/33.0& 8.3     58/51
11   1.18   0   287.0     103.5    919/1207   11.8/13.8     13/13     30.1& 4.3/32.1& 7.0     71/57
```

```
RUN# 163   DATE:  5/28/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME     NET       TIME      WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM   START/END   START/END   START/END       START/END            HUMID

 3   3.54   0   247.5     268.5    838/1134    1.0/ 1.0     14/12     26.5& 1.7/31.8& 6.8     87/58
 5   0.84   0   225.2      58.1    930/1156    1.5/ 3.1      1/ 4     29.2& 4.1/30.0& 5.1     72/66
 6   1.02   0   183.0      57.4   1010/1239    1.4/10.5     12/ 8     30.8& 5.3/28.8& 3.8     65/74
 7   0.97   0   257.1      76.2    901/1145    2.2/ 3.1     15/ 9     27.0& 2.5/30.8& 5.3     81/65
 8   0.90   0   208.8      57.4    940/1205    0.9/ 6.2     13/ 8     29.0& 4.0/29.0& 3.5     72/76
 9   0.87   0   215.6      57.4   1030/1247    2.0/ 5.8     16/ 8     29.5& 5.7/30.0& 4.5     62/70
10   1.24   0   187.3      71.2   1009/1233    1.9/ 7.0     16/ 6     30.0& 5.0/29.7& 4.5     67/70
11   0.93   0   245.7      69.9    920/1150    0.8/ 1.4     16/ 1     27.5& 3.2/30.0& 5.8     77/62
```

```
RUN# 164   DATE:  5/29/74   COOLING DEVICE CODE=2

ST   PHI    C    VOLUME      NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF     RELAT
 #                         SODIUM   START/END     START/END   START/END      START/END             HUMID

 3   0.47   0    266.8      38.1     835/1138     5.2/ 9.0     16/ 4     26.0& 2.5/29.2& 3.7     81/74
 4   0.44   0    172.0      23.1     853/1144     4.7/ 5.5     15/ 5     26.8& 2.7/29.8& 4.2     80/72
 5   0.66   0    248.0      49.9     934/1203     4.9/ 4.9     14/ 2     27.8& 3.2/29.9& 4.3     77/71
 6   0.64   0    206.2      40.6    1018/1244     7.1/10.6     16/ 5     28.8& 4.3/29.8& 4.5     70/70
 7   0.61   0    265.2      49.3     903/1151     5.7/ 4.0     16/ 2     26.2& 2.7/29.7& 4.6     80/69
 8   0.66   0    212.8      43.1     947/1212     3.8/ 3.2     16/ 5     27.5& 3.4/29.0& 4.0     75/72
 9   0.76   0    225.8      52.4    1023/1252     3.8/ 9.3     16/ 4     29.2& 4.4/30.0& 4.5     70/70
10   0.57   0    182.9      31.8    1008/1237     5.9/ 8.7     16/ 4     28.2& 4.0/31.0& 4.8     72/68
11   0.64   0    243.6      47.4     925/1157     4.0/ 5.8     16/ 3     27.5& 3.0/29.9& 4.6     78/69
```

```
RUN# 165   DATE:  5/30/74   COOLING DEVICE CODE=2

ST   PHI    C    VOLUME      NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF     RELAT
 #                         SODIUM   START/END     START/END   START/END      START/END             HUMID

 3   1.64   0    244.7     122.5     826/1111     0.4/ 5.2      1/ 5     25.8& 2.1/28.8& 3.6     84/75
 4   4.82   0    182.0     268.5     839/1114     0.3/         15/ 5     27.5& 2.7/     &        80/
 5   2.17   0    173.6     115.5     923/1125     2.4/          9/ 4     27.5& 3.0/     &        78/
 6   1.46   0    159.8      71.2    1005/1151     2.6/         15/ 7     28.8& 3.8/     &        74/
 7   1.83   0    190.1     109.5     851/1118     1.9/          7/ 6     27.2& 2.4/     &        82/
 8   1.45   0    173.0      76.8     935/1130     2.0/          9/ 7     29.0& 3.0/     &        79/
 9   1.34   0    151.1      63.7    1018/1155     1.4/         14/ 7     27.7& 3.5/     &        75/
10   1.06   0    145.9      47.4     955/1147     3.5/         15/ 7     29.5& 4.5/     &        69/
11   2.06   0    210.0     132.5     913/1122     3.8/          9/ 4     28.2& 2.7/     &        81/
```

RUN# 166 DATE: 5/31/74 COOLING DEVICE CODE=2

ST #	PHI	C	VOLUME	NET SODIUM	TIME START/END	WINDSPEED START/END	WIND DIR. START/END	DRY BULB TEMP & DIFF START/END	RELAT HUMID
3	4.97	0	262.1	398.5	930/1128	5.3/ 6.3	12/ 7	27.6& 3.6/30.0& 4.5	74/70
4	1.74	0	260.2	138.5	948/1134	2.1/ 6.7	12/ 8	28.1& 3.6/30.5& 4.5	75/70
5	1.02	0	215.1	67.4	930/1151	3.5/ 8.0	8/ 8	29.0& 3.9/31.2& 4.9	73/68
6	0.92	0	179.9	50.6	1012/1230	3.8/ 8.9	10/ 7	30.0& 4.8/31.0& 5.0	68/67
7	5.31	0	261.9	425.5	858/1140	1.9/ 6.0	10/ 8	28.0& 3.3/30.0& 5.0	76/67
8	1.00	0	204.1	62.4	942/1200	5.5/ 9.0	10/ 8	28.7& 3.7/30.0& 5.0	74/67
9	0.92	0	211.9	59.9	1023/1238	4.3/ 3.7	8/ 7	30.8& 5.6/30.9& 5.6	64/64
10	1.56	0	195.2	93.5	1002/1223	3.0/ 8.2	8/ 6	30.0& 4.7/31.5& 5.4	69/65
11	0.87	0	241.8	64.3	919/1146	3.6/ 9.5	11/ 8	28.5& 3.5/30.6& 5.1	75/66

RUN# 167 DATE: 6/ 3/74 COOLING DEVICE CODE=1

ST #	PHI	C	VOLUME	NET SODIUM	TIME START/END	WINDSPEED START/END	WIND DIR. START/END	DRY BULB TEMP & DIFF START/END	RELAT HUMID
3	1.52	0	239.9	111.5	832/1114	6.3/ 9.5	10/ 8	28.5& 4.0/30.0& 5.0	72/67
4	1.95	0	170.2	101.5	843/1119	5.9/ 6.6	12/10	28.4& 3.8/29.8& 4.6	73/69
5	1.26	0	218.7	84.6	928/1139	4.3/ 4.9	11/ 7	28.2& 4.2/32.0& 5.7	71/64
6	0.33	2	162.0	18.2	1011/1217	5.6/	11/ 7	29.0& 4.7/ &	68/
7	1.52	0	239.3	111.5	955/1127	5.3/ 4.2	9/12	28.5& 4.0/29.0& 5.0	72/66
8	1.28	0	190.3	74.5	939/1147	4.9/ 7.4	11/ 9	30.0& 5.7/31.7& 6.5	63/59
9	0.99	0	187.5	57.0	1022/1224	4.2/ 7.2	8/ 7	28.5& 5.2/30.0& 6.5	65/58
10	0.40	2	185.1	22.6	1000/1212	5.1/	13/ 7	27.9& 4.1/ &	71/
11	1.48	0	221.1	100.5	918/1133	4.8/ 5.6	14/13	29.0& 3.5/30.0& 4.9	76/68

```
RUN# 168   DATE:  6/ 4/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET       TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF      RELAT
 #                           SODIUM   START/END     START/END    START/END         START/END            HUMID

  3   1.44   0    196.8      101.5    833/1112      7.4/ 6.0       13/14     28.2& 3.0/30.0& 6.4        79/59
  4   1.31   0    183.2       75.7    848/1118      5.8/ 3.5       12/15     28.5& 3.2/30.3& 6.8        77/57
  5   1.11   0    177.4       59.5    929/1134      4.6/ 1.0       14/15     28.8& 4.6/30.0& 6.0        68/61
  6   1.27   0    182.6       70.7   1009/1208      4.5/ 8.5       13/ 4     29.6& 4.6/31.9& 6.1        69/62
  7   1.37   0    235.1       98.5    858/1124      5.5/ 4.2       11/13     28.0& 3.2/30.2& 5.9        77/62
  8   1.10   0    170.5       57.6    941/1141      3.7/ 4.3       11/15     29.0& 4.0/30.7& 6.5        72/58
  9   1.20   0    182.3       67.0   1013/1215      5.3/ 3.0       12/ 3     28.2& 4.1/30.0& 5.2        72/66
 10   1.02   0    173.1       53.9    959/1202      4.2/ 1.9       13/ 1     29.5& 4.5/31.0& 6.2        69/60
 11   1.23   0    214.6       83.9    920/1128      4.1/ 2.2       14/13     29.0& 3.8/30.2& 6.6        74/58
```

```
RUN# 169   DATE:  6/ 5/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET       TIME        WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF      RELAT
 #                           SODIUM   START/END     START/END    START/END         START/END            HUMID

  3   0.92   0    173.4       48.9    913/1020      0.6/           1/13      26.0& 1.5/     &           89/
  4   2.91   0    175.2      150.5    830/1023      1.0/           1/13      26.8& 1.8/     &           86/
  5   0.74   0    138.7       31.4    903/1033      3.6/           9/ 9      27.1& 3.0/     &           78/
  6   1.77   0    106.5       57.6    941/1100      3.7/           7/10      27.5& 3.0/     &           78/
  7   0.86   0    173.2       45.7    839/1026      1.3/           4/ 8      27.8& 3.3/     &           76/
 10   1.13   0    114.4       41.4    933/1055      1.8/           6/10      28.0& 3.5/     &           75/
 11   0.94   0    159.0       45.7    853/1029      1.6/          14/13      28.2& 3.2/     &           77/
```

```
RUN # 170   DATE:  6/ 6/74   COOLING DEVICE CODE=1

ST   PHI    C   VOLUME     NET        TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                        SODIUM   START/END   START/END   START/END        START/END          HUMID

 3   2.88   0    214.1    198.5    833/1101     5.5/ 9.1     10/ 7     29.0& 3.3/30.0& 4.0    77/73
 4   5.07   0    162.1    251.5    843/1111     7.1/ 9.2     10/ 7     29.0& 3.5/29.3& 3.3    76/77
 5   2.33   0    205.7    149.5    920/1128     2.8/ 7.0      7/ 4     29.0& 3.2/30.0& 3.2    78/78
 6   2.91   0    166.1    133.5   1002/1157     5.0/ 8.2     10/ 6     29.3& 4.5/31.8& 5.3    69/66
 7   2.33   0    226.8    161.5    853/1118     4.1/ 6.1      8/ 6     28.2& 4.2/30.1& 4.1    71/72
 8   2.17   0    183.0    121.5    931/1136     4.4/ 7.4      9/10     28.5& 3.3/29.3& 3.3    77/77
 9   2.13   0    180.7    120.5   1013/1204     1.8/ 4.9      8/ 5     30.2& 4.7/29.5& 4.4    69/70
10   1.93   0    163.5     96.5    951/1152     2.5/ 5.8     10/ 5     30.0& 4.7/32.0& 5.7    69/64
11   2.73   0    221.8    188.5    910/1123     5.5/ 8.0      8/ 6     28.5& 3.5/29.8& 3.8    75/74


RUN # 171   DATE:  6/ 7/74   COOLING DEVICE CODE=1

ST   PHI    C   VOLUME     NET        TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                        SODIUM   START/END   START/END   START/END        START/END          HUMID

 3   4.41   0    204.6    276.5    831/1050    10.6/11.5      7/ 7     28.6& 3.4/29.7& 4.1    76/72
 4  12.19   0    151.9    566.5    841/1056     9.6/ 9.2      7/ 7     28.8& 2.8/30.2& 3.7    80/75
 5   4.57   0    183.5    256.5    912/1115     7.7/ 6.4      6/ 6     28.2& 3.2/31.0& 4.0    77/73
 6   4.21   0    175.5    231.5    952/1146     9.7/ 9.1      7/ 6     30.0& 4.2/30.8& 4.8    72/68
 7   4.45   0    173.6    236.5    851/1103    10.7/ 9.4      6/ 6     28.7& 3.4/30.0& 4.8    76/68
 8   5.09   0    187.0    291.5    922/1121    12.7/10.1      8/ 8     29.2& 3.4/30.1& 3.9    76/74
 9   4.27   0    181.0    236.5   1000/1153     7.7/ 8.3      7/ 6     30.2& 4.2/31.5& 5.0    72/68
10   4.04   0    154.7    191.5    942/1139    10.0/ 9.2      6/ 6     30.0& 5.0/30.8& 5.6    67/64
11   5.63   0    209.6    361.5    934/1108     7.0/12.4      7/ 8     29.5& 3.3/31.0& 4.0    77/73
```

```
RUN# 172   DATE:  6/ 8/74   COOLING DEVICE CODE=1

ST   PHI    C   VOLUME      NET       TIME      WINDSPEED    WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                        SODIUM   START/END    START/END    START/END        START/END          HUMID

 3   5.74   0   251.2      441.5    838/1131    14.0/ 7.0      7/ 6     28.5& 3.0/30.0& 3.8     79/74
 4  13.86   0   242.0     1026.5    851/1135    10.2/16.0      6/ 6     30.5& 3.3/30.2& 5.0     78/67
 5   6.35   0   206.6      401.5    930/1148    11.7/15.9      5/ 5     29.0& 2.7/30.3& 2.4     81/83
 6   4.65   0   176.7      251.5   1000/1218    11.9/13.7      6/ 7     30.3& 3.7/30.6& 4.1     75/72
 7   5.59   0   260.7      446.5    902/1140     5.7/16.0      6/ 5     28.9& 3.7/30.4& 4.1     74/72
 8   5.86   0   208.1      373.5    942/1155     7.8/19.3      8/ 8     29.0& 3.2/31.0& 4.5     78/70
 9   5.35   0   202.4      331.5   1023/1227    13.8/23.6      5/ 7     30.7& 4.2/29.0& 3.7     72/74
10   4.58   0   179.4      251.5    953/1212    10.1/19.0      6/ 7     29.5& 3.5/31.0& 4.8     76/68
11   9.98   0   216.5      661.5    922/1145     8.0/15.9      8/ 7     29.0& 2.8/31.0& 4.2     80/72
```

```
RUN# 173   DATE:  6/10/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME      NET       TIME      WINDSPEED    WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                        SODIUM   START/END    START/END    START/END        START/END          HUMID

 3   4.47   0   176.5      241.5    842/1045     9.4/ 8.0      9/ 7     29.2& 3.2/28.4& 2.2     78/84
 4  49.54   0   105.0     1591.5    855/1049     9.4/ 4.9      8/ 6     28.8& 3.1/28.4& 3.4     78/76
 5   7.42   0   148.2      336.5    931/1058     3.7/          5/ 5     30.5& 4.3/      &       71/
 7   6.50   0   169.0      336.5    904/1052     6.1/ 9.7      7/ 7     29.0& 3.5/29.2& 4.4     76/70
 8   4.67   1   110.8      158.5    947/1103    11.6/          8/10     29.8& 3.0/      &       79/
11  23.83   0   157.1     1148.5    919/1056     5.9/          9/ 7     29.2& 3.7/      &       74/
```

```
RUN# 174   DATE:  6/11/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME      NET       TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                         SODIUM   START/END   START/END   START/END        START/END         HUMID

 3   2.23   0     95.0      65.3    951/1100    5.9/           7/ 6    27.8& 3.3/    &          76/
 4  23.31   0     96.9     691.5    904/1103    4.6/           7/ 6    28.0& 3.0/    &          78/
 5   3.45   0    133.0     141.5    937/1114    4.3/           7/ 5    29.2& 3.3/    &          77/
 6   2.55   0    126.2      98.5   1013/1137    5.5/           7/ 8    29.8& 4.3/    &          71/
 7   5.48   0    176.0     298.5    914/1106    5.3/           7/ 5    28.2& 3.4/    &          76/
 8   2.53   0    133.6     103.5    940/1119    7.4/           9/ 6    29.3& 3.3/    &          77/
 9   2.56   0    132.0     103.5   1023/1151    5.9/ 5.8       5/ 4    30.1& 4.5/29.2& 4.2      70/71
10   2.70   0    109.6      93.5   1007/1134    4.7/           6/ 6    30.0& 4.6/    &          69/
11   8.35   0    178.6     456.5    925/1110    4.0/           8/ 7    28.8& 3.3/    &          77/


RUN# 175   DATE:  6/12/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME      NET       TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                         SODIUM   START/END   START/END   START/END        START/END         HUMID

 3   4.80   0    232.6     341.5    841/1128    1.8/          13/ 6    27.8& 2.8/    &          80/
 4  14.53   0    213.9     976.5    853/1130    3.7/          16/ 5    27.5& 2.5/    &          82/
 5   4.41   0    197.6     266.5    942/1138    3.0/ 5.2      10/ 4    27.0& 3.0/31.0& 5.3      78/65
 6   3.14   0    183.8     176.5   1020/1223    3.1/ 6.1       9/ 4    29.0& 4.7/30.0& 5.8      68/62
 7   2.35   0    213.4     153.5    910/1133    2.4/           6/ 4    27.0& 2.4/    &          82/
 8   1.51   0    161.7      74.3    953/1145    2.8/ 6.4      10/ 3    27.7& 3.7/29.5& 4.8      74/68
 9   1.36   0    187.3      72.3   1032/1229    4.3/ 5.8       6/ 5    30.1& 5.5/29.3& 5.3      64/64
10   1.46   0    117.4      52.3   1011/1217       / 9.5      11/ 4    28.8& 4.1/30.9& 6.1      72/61
11   9.09   0    178.5     496.5    932/1135    4.5/          12/ 3    27.8& 3.0/    &          76/
```

```
RUN# 176   DATE:  6/13/74   COOLING DEVICE CODE=2

ST   PHI   C   VOLUME     NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM   START/END    START/END   START/END        START/END           HUMID

 3   1.68  0   221.0     113.5    918/1201     2.3/ 5.9      6/ 7      28.3& 3.1/28.8& 3.0     78/79
 4  17.94  0   233.3    1291.5    930/1206     6.2/ 2.5      9/ 4      28.5& 3.5/29.9& 4.2     75/72
 5   5.47  0   230.8     386.5   1010/1228     4.1/ 6.8      6/ 7      29.5& 3.0/30.2& 3.7     79/75
 6   2.16  0   191.1     126.5   1054/1258     3.8/ 5.2      4/ 4      28.8& 3.6/31.0& 4.8     75/68
 7   1.30  0   161.7      64.3    943/1216     3.8/10.7      5/ 4      28.5& 3.4/30.6& 4.2     76/72
 8   1.68  0   193.2      99.5   1022/1234     4.6/ 4.3      9/ 7      29.2& 3.7/30.4& 4.2     74/72
 9   1.38  0   173.7      73.1   1106/1306     4.5/ 4.9      3/ 3      30.3& 4.6/29.2& 4.0     69/72
10   1.57  0   150.2      72.3   1043/1253     5.0/ 4.7      4/ 4      29.7& 3.9/32.0& 5.5     73/65
11  14.25  0   232.3    1013.5   1001/1223     3.5/ 5.4      8/ 5      29.2& 2.8/30.1& 4.1     81/72
```

```
RUN# 177   DATE:  6/14/74   COOLING DEVICE CODE=2

ST   PHI   C   VOLUME     NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM   START/END    START/END   START/END        START/END           HUMID

 3   1.95  0    61.2      36.6    912/1034     4.9/ 3.6      3/ 4      28.8& 3.1/30.0& 4.2     78/72
 4  11.65  0   108.1     385.5    923/1038     3.4/ 5.0      8/ 4      29.0& 4.0/30.2& 4.4     72/71
 5   4.66  0    92.0     131.3    958/1054     4.3/ 4.9      3/ 3      28.3& 3.3/30.8& 4.7     77/69
 7   1.79  0    50.5      27.7    939/1042     3.4/ 4.9      2/ 5      29.0& 3.9/30.0& 4.5     73/70
 8  19.76  0    77.9     471.3   1009/1103     8.5/ 8.8      6/ 6      30.0& 3.5/30.3& 4.0     76/73
11   6.57  0    76.3     157.5    950/1048     5.1/ 5.0      4/ 5      28.5& 3.6/30.7& 4.7     75/69
```

```
RUN# 178   DATE:  6/15/74   COOLING DEVICE CODE=2

ST   PHI   C   VOLUME    NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
#                        SODIUM    START/END  START/END   START/END        START/END         HUMID

 3   4.31  0   229.7    303.3     832/1116    4.6/ 7.1     2/15     26.9& 1.7/31.0& 4.9     87/68
 4   1.94  0   240.7    143.3     844/1121    3.8/ 3.6    14/14     26.8& 1.9/30.5& 4.3     86/71
 5   1.92  0   169.2     94.1     925/1133    1.7/ 4.4    14/13     27.9& 2.9/29.8& 4.6     79/69
 6   1.52  0   186.7     87.0    1004/1204    2.6/        12/12     28.6& 3.4/    &         76/
 7   1.92  0   233.6    137.5     854/1125    2.4/10.7     1/15     27.1& 2.1/30.8& 4.8     84/68
 8   1.79  0   178.3     97.3     937/1138    2.5/ 4.6    13/ 1     28.0& 3.0/30.5& 4.7     78/69
 9   1.49  0   186.2     85.2    1011/1208    4.5/ 4.6    12/12     29.2& 3.8/31.9& 5.8     74/63
10   1.15  0   117.1     41.4     956/1201    4.4/        14/12     28.4& 3.2/    &         77/
11   1.55  0   154.1     73.3     916/1129    1.9/ 4.0     1/14     27.7& 2.2/31.1& 4.9     84/68
```

```
RUN# 179   DATE:  6/17/74   COOLING DEVICE CODE=1

ST   PHI   C   VOLUME    NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
#                        SODIUM    START/END  START/END   START/END        START/END         HUMID

 3   1.59  0   208.5    101.5     823/1044    8.0/12.2    13/11     27.5& 2.1/29.5& 3.5     84/76
 4   1.68  0   212.4    109.5     833/1050    8.8/ 6.0    12/10     27.5& 3.0/29.6& 4.1     78/72
 5   1.54  0   200.9     94.5     904/1107    6.4/ 5.2    12/11     27.6& 2.6/29.0& 4.3     81/70
 6   1.40  0   179.2     76.6     942/1138    7.2/ 5.6    11/10     28.5& 3.5/30.6& 5.1     75/66
 7   1.17  0    88.0     31.6     843/1055    7.1/ 7.2    12/10     27.2& 2.9/30.0& 5.0     79/67
 8   1.61  0   174.2     66.1     915/1115   10.4/ 8.1    12/12     28.0& 3.0/30.0& 4.5     78/70
 9   1.29  0   147.7     58.1     953/1144    7.0/ 8.8     9/10     29.3& 3.7/30.0& 4.9     75/68
10   1.29  0   160.2     63.1     934/1132    7.2/ 9.7    11/11     28.1& 3.1/30.0& 4.5     78/70
11   1.69  0   211.1    109.5     853/1100    7.7/ 6.2    13/12     27.9& 2.9/30.8& 4.0     79/73
```

```
RUN# 180    DATE:  6/18/74    COOLING DEVICE CODE=1

ST   PHI   C   VOLUME     NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM    START/END    START/END   START/END        START/END          HUMID

 3   0.53  0   154.1      25.2     811/1101     1.0/12.4       2/ 4    26.6& 2.4/28.4& 3.6     82/75
 4   0.48  0   168.5      24.5     828/1104     2.2/ 9.2      13/ 3    27.0& 2.5/29.2& 3.7     81/74
 5   0.68  0   241.0      50.2     848/1115     2.4/ 9.4      16/ 3    27.4& 2.6/30.2& 3.8     81/74
 6   0.73  0   190.2      42.7     927/1140     2.0/ 9.5      16/ 4    28.4& 4.2/30.4& 4.2     71/72
 7   0.65  0   241.0      47.7     833/1108     3.7/12.2       4/ 2    26.9& 2.7/29.0& 4.2     80/71
 8   0.86  0   212.2      55.8     857/1121     4.0/ 8.9       2/ 6    27.2& 3.0/29.5& 2.7     78/81
 9   0.53  0   200.1      38.3     933/1144     1.7/12.2       1/ 5    29.0& 4.0/30.2& 4.2     72/72
10   0.75  0   189.1      43.3     913/1135     2.7/ 9.1       2/ 3    28.2& 3.7/30.4& 4.8     74/68
11   0.64  0   162.6      32.0     842/1112     2.0/ 8.3       2/ 5    27.4& 2.9/29.5& 4.1     79/72
```

```
RUN# 181    DATE:  6/19/74    COOLING DEVICE CODE=1

ST   PHI   C   VOLUME     NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                       SODIUM    START/END    START/END   START/END        START/END          HUMID

 3   0.85  0   202.1      52.7     815/1041     2.5/ 6.2       3/ 5    27.0& 2.2/29.4& 4.0     84/73
 4   0.72  0   187.3      41.4     826/1045     3.1/ 7.7      15/ 3    27.4& 2.2/29.8& 4.4     84/70
 5   0.86  0   195.7      51.4     848/1057     2.8/ 4.7      15/ 3    28.2& 2.8/30.2& 3.8     80/74
 6   1.02  0   171.3      53.3     920/1125     3.5/ 7.2       3/ 3    28.4& 2.8/29.5& 4.0     80/73
 7   0.85  0   213.8      55.8     834/1049     3.2/ 4.7       1/ 2    27.2& 2.2/29.6& 4.2     84/71
 8   0.86  0   162.3      42.7     856/1104     4.1/ 4.7       6/ 4    28.4& 3.0/29.6& 3.8     79/74
 9   0.69  0   125.2      26.4     928/1133     2.3/ 7.6       4/ 4    29.4& 4.0/31.0& 4.1     73/72
10   0.75  0   174.2      40.2     913/1119     4.0/ 1.0      12/ 4    28.8& 3.4/28.8& 3.2     76/78
11   0.88  0   212.7      57.0     842/1053     2.6/ 7.6      15/ 4    28.0& 2.6/29.2& 4.2     81/71
```

RUN# 182 DATE: 6/20/74 COOLING DEVICE CODE=1

ST #	PHI	C	VOLUME	NET SODIUM	TIME START/END	WINDSPEED START/END	WIND DIR. START/END	DRY BULB TEMP & DIFF START/END	RELAT HUMID
3	0.68	5	59.0	12.4	810/1014	4.0/ 9.2	2/ 5	28.6& 4.8/29.0& 4.0	67/72
4	1.19	0	165.9	60.6	820/1018	2.3/ 6.1	5/ 3	25.8& 1.7/29.0& 4.0	87/72
5	1.41	0	156.4	67.4	855/1030	3.2/ 7.9	2/ 4	28.1& 3.0/30.7& 4.0	78/73
6	2.21	0	146.9	99.5	929/1111	4.5/ 6.7	7/ 3	28.3& 3.2/31.0& 5.2	77/66
7	1.14	0	167.8	58.7	836/1022	3.1/ 7.0	2/ 5	25.5& 1.5/28.8& 3.7	88/74
8	1.59	0	136.3	66.2	904/1035	2.2/11.2	4/ 5	27.7& 2.7/30.3& 3.3	80/78
9	1.86	0	164.6	93.5	935/1116	5.9/ 7.0	4/ 4	29.7& 4.7/31.0& 4.8	68/68
10	1.93	0	116.4	68.7	921/1105	2.8/ 6.9	1/ 1	28.7& 3.4/30.2& 5.2	76/66
11	1.32	0	160.[illegible]	64.9	848/1026	2.2/ 5.9	2/ 5	26.7& 2.0/29.0& 3.5	85/76

Low RPM on Station 3.

RUN# 183 DATE: 6/21/74 COOLING DEVICE CODE=1

ST #	PHI	C	VOLUME	NET SODIUM	TIME START/END	WINDSPEED START/END	WIND DIR. START/END	DRY BULB TEMP & DIFF START/END	RELAT HUMID
3	2.08	0	154.8	98.5	1004/1152	6.8/ 5.2	4/ 5	28.2& 2.5/29.2& 3.2	82/78
4	1.95	0	111.9	66.3	1012/1157	2.8/ 5.6	3/ 4	28.0& 3.2/30.8& 4.3	77/71
5	2.27	0	149.0	103.5	1039/1210	5.8/ 5.9	3/ 2	28.5& 3.5/30.4& 3.9	75/74
6	2.11	0	196.0	126.5	1112/1316	5.3/ 5.6	1/ 3	28.0& 3.5/30.5& 4.3	75/71
7	2.16	0	124.6	82.4	1019/1202	5.7/ 7.2	1/ 4	29.5& 3.5/29.2& 3.7	76/74
8	2.42	0	130.3	96.5	1043/1217	6.4/ 4.9	3/ 6	28.0& 3.0/28.7& 3.0	78/79
9	2.23	0	182.0	124.5	1121/1322	4.0/ 7.7	4/ 2	28.1& 3.1/30.7& 4.6	78/69
10	2.09	0	169.7	108.5	1105/1311	5.8/ 6.2	16/ 4	29.0& 4.2/29.2& 4.0	71/72
11	2.03	0	114.0	69.9	1032/1206	5.5/ 3.1	3/ 4	29.0& 3.5/30.3& 4.2	76/72

```
RUN# 184   DATE:  6/22/74   COOLING DEVICE CODE=1

ST   PHI   C   VOLUME    NET       TIME      WINDSPEED  WIND DIR.    DRY BULB TEMP C DIFF    RELAT
 #                      SODIUM   START/END   START/END  START/END       START/END            HUMID

 3   0.91  0   262.9     73.1    811/1125    7.0/ 0.8     1/13      24.8C 1.6/29.2C 3.3     87/77
 4   0.89  0   305.2     82.4    926/1138    2.2/ 0.7    15/ 2      24.2C 1.0/29.0C 3.6     92/75
 5   0.74  0   225.0     51.2    907/1208    4.4/ 3.4    16/ 5      24.8C 1.1/30.2C 3.7     91/75
 6   1.38  0   352.1    148.5    953/1430    3.3/ 4.6    16/ 4      26.4C 1.8/30.5C 3.3     86/78
 7   0.93  0   305.8     86.8    839/1149    2.8/ 1.6    15/ 3      24.0C 0.6/29.2C 3.7     95/74
 8   0.75  0   210.8     48.1    919/1219    4.3/ 2.5     1/10      25.4C 1.2/29.2C 3.6     90/75
 9   0.64  0   244.3     48.1   1010/1439    3.2/ 6.1    16/ 5      26.9C 2.0/30.4C 3.9     85/74
10   1.01  0   375.7    116.5    942/1422    4.9/ 5.1     1/ 5      26.2C 1.7/31.5C 4.5     87/70
11   0.99  0   293.3     81.2    857/1156    4.6/ 0.7    15/ 6      24.7C 1.1/29.4C 4.0     91/73
```

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```
RUN# 185   DATE:  6/22/74   COOLING DEVICE CODE=1

ST   PHI   C   VOLUME    NET       TIME      WINDSPEED  WIND DIR.    DRY BULB TEMP C DIFF    RELAT
 #                      SODIUM   START/END   START/END  START/END       START/END            HUMID

 3   1.00  0   283.3     86.8   1139/1502    0.6/ 3.7    16/ 4      29.2C 3.3/30.0C 3.5     77/76
 4   3.51  0   318.2    341.5   1144/1508    0.7/13.4     1/ 6      29.0C 3.6/29.5C 3.3     75/77
 5   1.31  5   115.1     46.2   1212/1531    3.4/ 7.4     5/ 3      30.2C 3.7/30.3C 3.3     75/78
 6   2.01  0    89.2     54.9   1434/1508    8.6/         5/ 4      30.5C 3.3/    C         78/
 7   1.20  0   316.8    116.5   1153/1516    1.6/ 5.9     4/ 1      29.2C 3.7/29.7C 3.3     74/77
 8   0.83  5    86.3     21.8   1222/1541    2.5/ 8.7     9/ 7      29.2C 3.6/29.9C 3.1     75/79
 9   0.64  0    63.3     12.4   1443/1512    6.1/11.4     5/ 5      30.4C 3.9/23.4C 2.6     74/81
10   0.82  0   133.6     33.7   1426/1504    5.1/         5/ 5      31.5C 4.5/    C         70/
11   2.35  0   321.5    231.5   1202/1524    0.7/ 6.9    16/ 5      29.4C 4.0/29.9C 3.4     73/77
```

Low RPM on Stations 5 and 8. Calculated RPM values at Stations 6 and 10 are in excess of 2,000 RPM. All input data was checked and found to be correct, although such high RPM's are not likely to occur.

```
RUN# 186   DATE:  6/25/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME     NET       TIME      WINDSPEED  WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM   START/END   START/END  START/END        START/END          HUMID

 3  22.93   0   141.2     991.5    845/1115    30.4/22.8     9/10    28.4& 1.9/29.5& 2.3     86/84
 4  13.95   0   252.6    1078.5    855/1120    28.1/36.8     9/ 9    29.0& 2.2/29.9& 2.4     85/83
 5  14.62   0   240.9    1078.5    910/1132    21.5/26.1    10/ 9    27.8& 2.3/29.0& 2.5     83/83
 6  20.57   0   159.4    1003.5   1000/1208    25.3/25.1    10/10    28.5& 3.0/29.4& 3.5     79/76
 7  15.34   0   252.3    1184.5    904/1125    19.0/18.3     9/10    28.4& 2.2/28.0& 1.8     84/86
 8  16.87   0   239.0    1234.5    931/1140    24.9/26.5    12/ 9    28.0& 2.1/29.0& 2.5     84/83
 9  15.41   0   203.4     959.5   1000/1213    12.3/15.7     9/ 9    28.7& 3.2/29.5& 3.5     78/76
10  12.92   0   136.9     541.5    951/1204    21.0/23.8     9/ 9    28.5& 3.1/29.4& 3.2     78/78
```

```
RUN# 187   DATE:  6/27/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME     NET       TIME      WINDSPEED  WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM   START/END   START/END  START/END        START/END          HUMID

 4   7.50   0   261.0     606.5    830/1115    13.6/27.7     9/ 9    29.6& 1.7/30.8& 2.4     91/83
 5   7.44   0   166.7     379.5    905/1128    18.6/18.7     9/ 9    29.0& 1.6/30.4& 3.6     89/76
 6   6.49   0   172.3     354.5    942/1152    19.3/20.5    11/11    29.5& 2.6/31.2& 4.0     82/73
 7   6.55   0   159.2     319.5    848/1120    19.6/17.6     9/ 9    28.7& 2.0/30.8& 3.2     86/78
 8   6.97   0   251.9     494.5    915/1135    25.4/21.1    11/11    29.0& 1.9/30.5& 3.6     87/76
 9   5.11   0   204.3     319.5    949/1157    13.7/16.4     8/ 9    29.6& 2.6/30.4& 3.6     82/76
10   5.00   0   179.2     279.5    934/1147    17.6/18.4     9/10    29.8& 3.0/31.1& 3.9     79/74
11   5.85   0   259.4     464.5    858/1124    21.1/23.3    10/11    29.7& 2.1/31.5& 3.0     85/80
```

```
RUN# 138   DATE:  6/27/74   COOLING DEVICE CODE=2

ST   PHI   C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                       SODIUM   START/END    START/END   START/END      START/END           HUMID

 4   6.36  0   231.8     429.5   1113/1341    27.7/24.4     9/10     30.8& 2.4/31.5& 2.6    83/82
 5   6.30  5   114.9     221.5   1131/1353    18.7/18.0     9/ 9     30.4& 3.6/31.4& 3.4    76/77
 6   6.69  0   175.9     359.5   1155/1423    20.5/22.7     9/11     31.2& 4.0/31.9& 4.5    73/71
 7   6.45  5    74.2     146.5   1123/1345    17.5/19.1     9/10     30.8& 3.2/31.4& 3.9    78/74
 8   5.00  0   238.0     364.5   1137/1403    21.1/17.9     9/ 9     30.5& 3.6/31.6& 3.4    76/77
 9   4.91  0   232.4     349.5   1202/1428    16.4/15.5     9/10     30.4& 3.6/32.0& 4.8    76/69
10   5.34  0   195.5     319.5   1150/1419    18.4/21.4     9/10     31.1& 3.9/31.9& 4.7    74/70
11   7.35  0   253.1     569.5   1127/1350    23.3/28.9     9/11     31.5& 3.0/31.4& 3.2    80/78
```

Low RPM on Stations 5 and 7.

```
RUN# 139   DATE:  6/28/74   COOLING DEVICE CODE=2

ST   PHI   C   VOLUME     NET       TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                       SODIUM   START/END    START/END   START/END      START/END           HUMID

 3   4.46  0   197.5     269.5    850/1057    23.2/12.8     9/ 9     29.5& 1.7/30.6& 2.7    88/81
 4   4.34  0   248.2     329.5    830/1103    19.0/14.0     9/ 9     29.4& 1.2/30.9& 2.9    91/80
 5   4.14  0   152.8     206.5    910/1117    10.7/ 9.1     9/10     30.5& 2.5/29.7& 3.2    83/78
 6   6.94  5    58.6     174.5    940/1144    10.1/10.2    12/11     30.8& 3.0/30.0& 2.8    79/81
 7   4.12  0   241.7     304.5    840/1107    15.4/12.0     9/10     29.4& 2.2/29.9& 3.4    85/77
 8   3.74  0   193.6     221.5    913/1123    15.9/ 9.0    11/12     30.2& 2.3/29.8& 2.9    84/80
 9   3.13  0   194.3     189.5    948/1154     8.8/ 8.7     9/ 8     30.3& 2.4/30.6& 3.5    83/76
10   3.09  0   168.4     159.5    933/1140    11.4/11.7    10/10     30.8& 2.9/30.2& 3.5    80/76
11   4.49  0   157.4     216.5    903/1112    17.0/14.3    10/11     30.2& 1.5/30.8& 2.4    89/83
```

Low RPM on Station 6.

```
RUN# 190   DATE:  6/29/74   COOLING DEVICE CODE=2

ST    PHI    C    VOLUME      NET       TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                          SODIUM   START/END     START/END    START/END        START/END            HUMID

 4    9.08   0    302.8     841.5    817/1135     11.9/11.8       7/ 5      29.6C 1.8/31.0C 2.8       87/81
 5    5.89   0    297.0     534.5    905/1206      6.9/10.9       8/ 5      30.4C 2.9/31.8C 2.9       80/80
 6   17.15   5     80.3     421.5   1002/1254      6.8/12.5       7/ 5      30.9C 3.2/31.2C 3.0       78/80
 7    5.75   0    303.8     534.5    833/1145     11.6/11.0       7/ 6      29.7C 2.9/31.1C 2.7       80/81
 8    4.79   0    258.7     379.5    920/1219      9.2/14.2       8/ 8      29.9C 2.8/31.4C 2.7       81/81
 9    4.57   0    263.9     369.5   1016/1305      7.2/16.4       4/ 4      31.8C 3.4/31.4C 3.5       77/76
10    3.55   5    111.8     121.5    945/1244      7.3/ 9.2      16/ 6      28.9C 2.3/32.2C 3.8       84/75
11    8.16   0    304.1     759.5    850/1157      8.3/11.4       8/ 6      30.2C 2.3/31.7C 3.2       84/78
```

Low RPM on Stations 6 and 10.

```
RUN# 191   DATE:  7/ 1/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET       TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                          SODIUM   START/END     START/END    START/END        START/END            HUMID

 4   10.13   0    248.3     769.5   1104/1345      9.4/ 8.6       6/ 5      29.2C 2.7/30.2C 2.1       81/85
 5    3.39   0    187.3     194.5   1129/1400      7.8/11.2       5/ 5      29.0C 2.5/29.8C 1.8       83/87
 6    4.37   0    127.1     189.5   1216/1427      7.4/ 8.5       6/ 6      28.8C 2.7/28.8C 3.3       81/77
 8    2.90   0    213.7     189.5   1137/1406      7.6/10.8       7/ 8      29.0C 3.0/29.2C 1.4       79/90
 9    2.94   0    153.7     174.5   1225/1432      6.2/ 9.2       6/ 6      29.2C 2.9/29.0C 3.0       80/79
10    2.75   0    137.0     115.3   1208/1423      7.9/ 8.5       5/ 6      29.0C 3.0/29.1C 3.3       79/77
11    6.34   0    248.3     459.5   1121/1356      7.7/ 5.7       6/ 6      28.7C 3.5/29.5C 2.5       76/83
```

```
RUN# 192   DATE:  7/ 2/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME     NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                          SODIUM    START/END    START/END   START/END         START/END           HUMID

  3   6.36   0    283.2     551.5     822/1126    17.5/11.2      8/ 7     28.8& 2.6/30.0& 3.0      82/79
  4   5.63   0    252.4     744.5     835/1130    14.8/11.3      6/ 6     29.4& 2.4/32.0& 5.2      83/67
  5   6.54   0    254.6     509.5     937/1142    10.9/11.2      6/ 6     28.8& 2.8/30.5& 3.5      80/76
  6  15.87   5     51.4     249.5     944/1209     8.9/          7/ 9     28.8& 2.8/     &         80/
  7   6.70   0    272.9     559.5     848/1135    13.9/10.6      7/ 6     28.4& 2.8/30.5& 4.0      80/73
  8   6.68   0    171.0     349.5     917/1148    10.4/18.0      8/ 8     29.1& 2.8/29.8& 3.6      80/75
  9   5.63   0    221.2     379.5     952/1212    10.7/ 9.9      6/ 8     30.1& 3.6/29.9& 3.5      76/76
 10   5.17   0    179.6     234.5     935/1206     9.2/          7/ 7     29.2& 3.2/     &         78/
 11   6.97   0    252.9     539.5     901/1138    10.3/10.9      8/ 8     29.2& 2.4/29.7& 3.0      83/79
```

Low RPM on Station 6.

```
RUN# 193   DATE:  7/ 3/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME     NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                          SODIUM    START/END    START/END   START/END         START/END           HUMID

  3   7.60   0    190.6     443.5     815/1023     7.0/10.1      7/ 7     27.5& 1.6/28.5& 2.0      88/86
  4  12.95   0    141.6     561.5     825/1031     6.1/10.2      7/ 5     27.9& 1.7/29.1& 2.4      87/83
  5   7.69   0    179.1     421.5     857/1047     6.5/10.0      6/ 6     28.8& 2.0/30.1& 2.6      86/82
  6  10.39   0    111.0     373.5     935/1122    10.1/11.8      8/ 7     29.2& 2.9/30.7& 3.6      80/76
  7   7.25   0    150.7     423.5     835/1038     4.0/10.1      6/ 6     27.8& 2.0/28.0& 2.0      85/85
  8   7.34   0    166.2     373.5     907/1055    10.7/13.3     10/ 9     29.0& 2.7/29.5& 2.3      81/84
  9   6.93   1    162.3     341.5     947/1130    10.7/13.6      5/ 5     29.2& 2.8/31.0& 3.5      81/76
 10   5.32   5     91.7     153.5     926/1114     9.7/12.9      7/ 6     28.8& 2.8/30.1& 2.8      80/81
 11   8.37   0    196.5     503.5     948/1043    10.0/11.4      7/ 6     29.0& 2.0/29.1& 2.0      86/86
```

Low RPM on Station 10.

```
RUN# 194   DATE:  7/ 6/74   COOLING DEVICE CODE=1

ST    PHI    C   VOLUME      NET       TIME       WINDSPEED    WIND DIR.     DRY BULB TEMP & DIFF     RELAT
 #                          SODIUM   START/END    START/END    START/END         START/END            HUMID

 3    9.20   0   199.3      551.5    853/1114      9.8/          7/ 6     27.6& 1.8/      &            86/
 4    9.82   0   197.5      593.5    915/1119     18.8/          6/ 6     29.3& 2.6/      &            82/
 5    8.02   0    84.0      238.5    956/1132      8.2/          5/ 8     29.7& 2.7/      &            81/
 6   13.47   0   103.5      426.5   1044/1234      9.1/          8/ 7     29.2& 2.3/      &            84/
 7    8.71   0   188.1      501.5    926/1124     15.6/          6/ 6     28.8& 2.8/      &            80/
 8   10.62   0   131.2      426.5   1010/1140     14.6/         10/ 9     29.2& 2.1/      &            85/
 9    7.18   0   157.7      346.5   1059/1238     10.7/13.3      9/ 6     30.0& 3.1/29.0& 2.2          79/85
10    8.08   0   134.8      333.5   1034/1231      7.5/          6/ 5     28.9& 2.7/      &            81/
11    9.15   0   180.8      506.5    940/1128     13.0/          6/ 8     29.8& 2.0/      &            86/
```

```
RUN# 195   DATE:  7/ 8/74   COOLING DEVICE CODE=2

ST    PHI    C   VOLUME      NET       TIME       WINDSPEED    WIND DIR.     DRY BULB TEMP & DIFF     RELAT
 #                          SODIUM   START/END    START/END    START/END         START/END            HUMID

 3    3.31   0   257.9      261.5    843/1141      7.7/ 8.0      7/ 7     29.7& 3.2/29.5& 3.3          78/77
 4   11.57   0   271.4      961.5    901/1148     10.3/ 9.7      6/ 6     29.7& 3.2/29.8& 4.0          78/73
 5    3.56   0   253.5      276.5    936/1207      7.9/ 6.7      5/ 7     30.5& 3.0/30.0& 3.5          79/76
 6    4.80   0    87.4      128.5   1017/1241      7.5/ 5.7      9/ 7     29.6& 3.1/30.0& 3.9          79/74
 7    3.33   0   263.0      316.5    912/1155      9.7/ 6.8      5/ 7     29.1& 3.4/29.5& 3.7          76/75
 8    3.56   0   213.7      238.5    949/1216     12.1/ 6.3     10/10     29.8& 3.0/30.1& 3.5          79/76
 9    3.34   0   213.9      223.5   1023/1248      8.3/ 7.6      6/ 7     30.8& 4.5/31.7& 4.8          70/69
10    3.06   0   180.0      168.5   1007/1234      8.1/ 8.3      9/ 6     29.0& 3.5/31.0& 4.7          76/69
11   11.56   0   253.4      396.5    926/1201     12.1/ 7.0      8/ 7     30.0& 3.1/29.5& 3.4          79/77
```

```
RUN# 196   DATE:  7/ 9/74   COOLING DEVICE CODE=2

 ST   PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.   DRY BULB TEMP & DIFF    RELAT
  #                          SODIUM    START/END    START/END    START/END        START/END            HUMID

  3   3.87   0    225.0      266.5     823/1054      6.5/ 7.8      7/ 7     28.8& 2.6/30.5& 3.8     82/74
  4  14.63   0    143.8      673.5     830/1059      6.4/ 7.2      7/ 7     29.2& 2.9/31.2& 4.5     80/70
  5   6.61   0    229.1      463.5     854/1113     10.0/ 9.3      7/ 5     30.2& 3.0/30.3& 3.1     79/79
  6   5.19   0    152.1      241.5     925/1148      9.5/ 7.8      9/ 8     29.6& 3.4/32.4& 5.0     77/68
  7   5.40   0    236.7      391.5     839/1105      8.6/ 9.4      6/ 7     28.9& 3.0/30.4& 4.2     79/72
  8   3.59   0    203.3      223.5     904/1121     10.9/10.7     11/ 8     29.0& 2.1/31.0& 3.8     85/74
  9   2.63   0    218.9      176.5     932/1153      6.4/ 8.6      8/ 6     29.6& 3.7/31.6& 4.6     75/70
 10   2.59   0    181.1      143.5     919/1144      8.5/ 8.7      8/ 8     28.7& 2.8/31.7& 4.9     80/68
 11   9.57   0    229.8      673.5     847/1109     12.1/ 8.3      8/ 8     28.8& 2.1/30.9& 4.1     85/72
```

```
RUN# 197   DATE:  7/10/74   COOLING DEVICE CODE=2

 ST   PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.   DRY BULB TEMP & DIFF    RELAT
  #                          SODIUM    START/END    START/END    START/END        START/END            HUMID

  3   2.44   0    233.4      188.5     820/1058      7.0/ 7.4     16/ 4     27.2& 1.8/29.3& 3.6     86/75
  4   3.77   0    222.3      256.5     834/1102      4.3/ 4.7      5/ 4     27.5& 2.1/31.0& 4.6     84/69
  5   2.56   0    151.2      118.5     857/1113      3.3/         13/12     27.4& 2.0/     &        85/
  6   2.89   0    145.8      126.5     930/1136      0.2/ 8.7      9/ 5     28.8& 2.9/32.2& 5.1     80/68
  7   2.11   0    234.1      151.5     841/1108      5.4/ 6.8      1/ 5     26.7& 1.6/31.2& 4.6     88/70
  8   1.55   0    187.5       88.7     907/1118      1.9/         16/ 5     29.0& 2.8/     &        80/
  9   1.37   0    165.0      111.5     944/1141      3.4/ 3.4      6/ 4     30.0& 3.8/30.4& 4.2     74/72
 10   1.92   0    172.8       96.5     923/1132      1.5/         14/ 5     28.9& 2.9/     &        80/
 11   2.83   0    230.1      203.5     850/1112      3.5/         16/ 4     28.0& 2.5/     &        82/
```

RUN# 198 DATE: 7/11/74 COOLING DEVICE CODE=2

ST #	PHI	C	VOLUME	NET SODIUM	TIME START/END	WINDSPEED START/END	WIND DIR. START/END	DRY BULB TEMP & DIFF START/END	RELAT HUMID
3	9.28	0	261.2	741.5	815/1107	2.5/ 4.1	14/14	26.9& 1.4/30.2& 4.2	89/72
4	2.21	0	273.0	184.5	825/1113	2.8/ 3.4	13/13	27.8& 2.1/31.6& 5.4	84/65
5	2.08	0	243.1	154.5	901/1124	2.9/ 0.8	10/15	28.5& 2.7/30.5& 4.5	81/70
6	2.27	0	196.4	136.5	937/1153	2.5/ 2.3	11/ 5	29.5& 4.2/31.5& 4.7	71/69
7	2.37	0	255.5	185.5	834/1117	2.1/ 0.7	16/ 8	27.9& 2.3/32.0& 6.0	83/62
8	2.01	0	211.0	129.5	911/1131	4.0/ 6.3	14/16	29.0& 3.6/30.6& 1.1	75/92
9	1.64	0	159.9	80.3	945/1204	3.7/ 2.0	10/ 8	30.0& 4.0/32.3& 6.2	73/61
10	4.15	0	186.2	236.5	930/1148	3.4/ 1.2	10/ 1	29.3& 3.5/32.8& 5.7	76/64
11	1.98	0	236.2	144.5	849/1121	2.7/ 0.3	14/15	26.5& 3.0/30.8& 5.4	79/65

RUN# 199 DATE: 7/12/74 COOLING DEVICE CODE=2

ST #	PHI	C	VOLUME	NET SODIUM	TIME START/END	WINDSPEED START/END	WIND DIR. START/END	DRY BULB TEMP & DIFF START/END	RELAT HUMID
3	5.31	0	244.5	396.5	817/1106	5.8/ 7.3	15/16	27.7& 2.1/31.2& 5.0	84/67
4	0.64	0	250.5	49.0	825/1111	4.3/ 9.1	13/13	27.8& 2.1/31.2& 5.0	84/67
5	0.62	0	250.7	47.8	853/1123	7.2/ 7.4	14/12	28.0& 2.4/31.6& 5.4	82/65
6	1.17	0	157.3	56.5	925/1152	8.5/ 6.3	13/13	28.9& 3.3/31.0& 5.2	77/66
7	0.44	5	132.3	17.3	832/1116	6.2/ 7.9	12/13	27.8& 2.4/31.2& 3.0	82/80
8	0.70	0	229.0	49.0	902/1130	8.6/ 7.3	1/15	28.7& 2.9/31.3& 5.6	80/64
9	0.64	0	223.5	44.0	932/1157	8.7/ 5.1	14/11	29.2& 3.3/32.4& 6.2	77/61
10	0.51	0	205.1	32.3	913/1148	6.1/10.1	14/14	29.2& 3.2/32.1& 6.5	78/60
11	0.66	0	256.6	51.5	843/1120	7.2/ 3.3	15/16	28.2& 2.6/32.0& 5.4	81/66

Low RPM on Station 7.

```
RUN# 200   DATE:  7/13/74   COOLING DEVICE CODE=2

ST   PHI   C   VOLUME      NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM   START/END    START/END   START/END        START/END          HUMID

 3   1.95  0   309.8      184.5    845/1212     5.0/ 5.0     15/14    25.7& 1.2/30.0& 3.4     91/77
 4   0.74  0   293.8       66.5    900/1219     2.9/ 1.3     15/10    26.1& 1.7/30.5& 3.8     87/74
 5   0.79  0   300.7       72.8    934/1239     4.6/ 5.2     13/11    27.6& 2.8/30.4& 4.1     80/72
 7   0.77  0   314.3       74.0    910/1226    10.5/ 2.7     16/13    26.3& 1.4/30.8& 4.6     89/69
 8   0.77  0   260.2       61.5    950/1248     9.3/ 6.1      3/ 2    27.4& 3.0/30.6& 4.6     78/69
11   0.83  5   173.7       44.0    924/1232     4.8/ 4.8     16/14    27.0& 2.4/30.6& 3.7     82/75
```

Low RPM on Station 11.

```
RUN# 201   DATE:  7/15/74   COOLING DEVICE CODE=2

ST   PHI   C   VOLUME      NET        TIME       WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM   START/END    START/END   START/END        START/END          HUMID

 3   8.44  0   230.8      596.5   1004/1237     4.2/ 6.7     13/ 5    29.0& 4.8/30.4& 5.2     67/66
 4  14.91  0   215.8      984.5   1016/1244     2.0/ 8.1      9/ 5    29.3& 5.0/30.9& 5.9     66/62
 5   7.41  0   218.1      494.5   1049/1302     1.6/ 6.4     14/ 3    29.3& 6.2/31.5& 5.7     59/64
 7   4.14  0   228.6      289.5   1027/1249     4.0/ 8.2     14/ 4    28.8& 5.7/30.1& 5.6     62/63
 8   4.71  0   191.8      276.5   1100/1309     1.9/ 8.5     13/ 8    30.1& 6.0/30.7& 4.9     61/68
11   9.13  0   229.5      641.5   1039/1256     4.3/ 5.9     13/ 4    29.5& 5.5/30.8& 5.8     63/62
```

```
RUN# 202   DATE:  7/15/74   COOLING DEVICE CODE=2

ST   PHI    C   VOLUME     NET       TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                        SODIUM   START/END   START/END   START/END        START/END          HUMID

 3   5.01   0   361.7     554.5    749/1148    5.5/ 3.5      13/ 9     26.2C 2.1/31.6C 4.2    84/72
 4   4.31   0   293.0     386.5    842/1156    4.7/15.7      11/ 8     25.8C 1.2/31.3C 4.7    91/69
 5   1.75   0   300.9     161.5    917/1219    3.4/ 8.3      10/ 8     27.2C 2.7/31.3C 4.9    80/68
 6   2.33   0   181.3     129.5   1005/1254    2.9/ 9.0      12/10     29.7C 3.8/30.7C 5.7    74/63
 7   1.32   0   204.6      92.8    853/1204    1.9/12.5      11/ 9     26.7C 2.3/31.4C 4.6    83/70
 8   1.85   0   274.0     155.5    929/1227    3.3/ 6.0      14/12     28.2C 3.2/32.0C 5.7    77/64
 9   1.63   0   262.7     135.5   1013/1304    1.4/ 6.9       9/ 8     29.6C 4.4/31.2C 5.7    70/63
10   2.03   0   146.8      94.5    955/1247    4.1/ 8.2       8/ 7     29.2C 3.8/32.8C 6.7    74/59
11   1.90   0   309.9     160.5    904/1211    2.1/14.4      14/10     26.9C 2.1/31.5C 4.3    84/72
```

```
RUN# 203   DATE:  7/16/74   COOLING DEVICE CODE=1

ST   PHI    C   VOLUME     NET       TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF   RELAT
 #                        SODIUM   START/END   START/END   START/END        START/END          HUMID

 3   4.38   0   232.1     311.5    813/1051   13.2/14.0       7/ 6     29.2C 3.0/30.7C 4.1    79/72
 4  12.86   0   228.5     899.5    824/1057   14.2/17.8       6/ 6     29.8C 3.0/30.8C 4.2    79/72
 5   4.61   0   169.7     239.5    852/1110   11.8/17.0       6/ 5     30.8C 3.1/31.6C 4.4    79/71
 6  14.89   5    52.5     239.5    924/1133   10.3/19.1       8/ 7     29.9C 3.5/29.8C 4.2    76/72
 7   4.69   0   236.3     339.5    836/1101   15.2/12.2       6/ 7     28.5C 3.1/30.2C 3.5    78/76
 8   5.17   0   206.2     326.5    903/1117   18.1/13.3       9/10     29.2C 2.8/31.2C 4.3    81/71
 9   3.59   0   204.4     224.5    932/1139   14.6/           5/ 7     30.7C 4.2/     C       72/
10   3.68   0   172.6     194.5    917/1128    7.8/14.7       8/ 6     30.2C 3.8/30.7C 4.5    74/70
11   6.27   0   235.3     451.5    843/1106   14.5/16.3       6/ 7     29.9C 3.2/30.5C 3.8    78/74
```

Low RPM on Station 6.

```
RUN# 204   DATE:  7/18/74   COOLING DEVICE CODE=1

ST    PHI    C   VOLUME      NET        TIME      WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                          SODIUM    START/END   START/END   START/END         START/END          HUMID

 3    4.29   0   195.4      256.5    1054/1302   14.0/10.0      6/ 6     30.7& 4.1/32.2& 4.6      72/70
 4   12.74   0   211.9      826.5    1059/1306   17.8/18.7      6/ 6     30.8& 4.2/31.4& 4.4      72/71
 5    4.95   0   134.8      204.5    1112/1319   17.0/11.4      9/ 6     31.6& 4.4/32.6& 4.8      71/69
 6    6.00   0   139.8      256.5    1137/1345   19.1/12.2      7/ 6     29.8& 4.2/31.5& 5.5      72/65
 7    3.99   0   212.2      259.5    1104/1311   12.2/19.4      7/ 6     30.2& 3.5/31.5& 4.1      76/73
 8    4.48   0   201.5      276.5    1119/1325   13.3/16.C     10/ 8     31.2& 4.3/31.8& 3.6      71/76
10    3.50   0   183.7      196.5    1131/1341   14.7/11.3      6/ 6     30.7& 4.5/32.6& 5.0      70/68
11    7.89   0   215.1      519.5    1108/1315   16.3/14.8      7/ 6     30.5& 3.8/32.0& 3.8      74/75
```

```
RUN# 205   DATE:  7/19/74   COOLING DEVICE CODE=1

ST    PHI    C   VOLUME      NET        TIME      WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                          SODIUM    START/END   START/END   START/END         START/END          HUMID

 3    5.52   0   246.1      415.5     825/1109   13.9/12.5      6/ 5     29.4& 3.2/30.0& 3.6      78/76
 4   12.59   0   254.8      941.5     836/1116   13.8/14.9      7/ 5     30.2& 3.2/31.9& 5.3      78/66
 5    6.84   0   271.9      569.5     912/1150   10.1/17.5      5/ 5     30.1& 3.1/30.7& 3.7      79/75
 6   11.54   5    69.8      246.5     947/1228    9.1/14.3      7/ 5     30.0& 3.9/31.1& 4.3      74/71
 7    5.11   0   253.4      396.5     844/1122   13.1/16.0      6/ 4     28.8& 3.6/30.4& 4.5      75/70
 8    5.43   0   241.5      401.5     925/1159   11.3/16.9      8/ 8     29.2& 3.1/30.5& 2.6      78/82
 9    5.00   0   254.7      389.5     955/1236    8.0/ 9.3      5/ 4     31.2& 4.7/31.6& 4.5      69/71
10    4.26   0   215.7      261.5     940/1218    8.0/12.4      4/ 5     30.7& 4.7/31.8& 5.0      69/68
11    8.74   0   278.2      744.5     902/1143   14.5/14.0      7/ 6     30.5& 3.2/31.8& 3.6      78/76
```

Low RPM on Station 6.

```
RUN# 206    DATE:  7/20/74    COOLING DEVICE CODE=1

ST   PHI    C   VOLUME      NET        TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM    START/END    START/END   START/END        START/END          HUMID

 3   3.78   0   235.0     272.3     930/1201    3.1/ 9.1       6/ 4     30.0& 4.2/31.5& 5.3     72/66
 4   7.21   0   247.9     547.3     937/1209    4.6/ 8.4       4/ 2     30.2& 5.1/31.5& 6.3     66/60
 5   3.80   0   255.3     297.3    1003/1235    5.7/11.2       6/ 5     30.7& 5.0/31.6& 6.3     67/60
 6   5.87   0   164.3     255.3    1031/1319    2.2/10.1       5/ 8     31.0& 5.2/32.2& 6.4     66/60
 7   3.80   0   234.0     272.3     941/1217    2.4/ 8.6      15/ 5     29.8& 5.3/31.3& 5.8     65/63
 8   3.70   0   235.3     267.3    1003/1245    4.4/11.3       9/ 8     30.2& 4.3/31.3& 5.4     71/65
 9   3.43   0   256.0     272.3    1037/1318    4.1/ 7.1       2/ 5     32.0& 5.8/33.2& 6.6     64/60
10   3.33   0   206.3     210.3    1023/1302    1.9/10.8       5/ 4     31.4& 5.7/32.0& 6.3     63/61
11   4.65   0   244.0     347.3     953/1225    6.2/ 8.0       5/ 5     29.9& 4.5/31.1& 5.7     70/63
```

```
RUN# 207    DATE:  7/20/74    COOLING DEVICE CODE=1

ST   PHI    C   VOLUME      NET        TIME      WINDSPEED   WIND DIR.   DRY BULB TEMP & DIFF    RELAT
 #                        SODIUM    START/END    START/END   START/END        START/END          HUMID

 3   3.40   0   277.5     288.5    1204/1503    9.1/ 8.1       3/ 5     31.5& 5.3/32.0& 7.0     66/57
 4  10.14   0   270.3     866.5    1211/1506    8.4/ 7.1       4/ 4     31.5& 6.3/31.9& 6.2     60/61
 5   3.96   0   267.6     324.5    1233/1517   11.2/ 8.5       5/ 5     31.6& 6.3/32.0& 5.8     60/64
 6   4.43   0   169.3     229.5    1313/1540   10.1/ 7.7       8/ 6     32.2& 6.4/32.1& 7.1     60/56
 7   3.36   0   261.8     269.5    1221/1510    8.6/ 8.9       3/ 6     31.3& 5.8/31.8& 6.2     63/61
 8   3.09   0   234.4     221.5    1243/1522   11.3/10.1       8/ 9     31.3& 5.4/31.5& 5.4     65/65
 9   2.93   0   224.8     201.5    1322/1545    7.1/10.7       5/ 5     33.2& 6.6/32.3& 6.5     60/60
10   2.77   0   202.4     171.5    1305/1536   10.3/ 8.9       5/ 5     32.0& 6.3/31.8& 6.6     61/59
11   6.17   0   276.4     521.5    1224/1514    8.0/10.7      .5/ 6     31.1& 5.7/31.3& 5.8     63/63
```

```
RUN# 209    DATE:  7/21/74    COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM   START/END    START/END   START/END         START/END          HUMID

 3    1.67   0    257.5      131.5    755/1046     6.7/ 2.2     12/12      27.8& 3.2/31.2& 5.4    77/65
 4    1.79   0    275.9      151.5    807/1054     3.4/ 1.0     13/11      27.6& 2.4/31.4& 6.0    82/62
 5    1.66   0    278.6      141.5    833/1116     2.6/ 3.5     15/ 6      27.6& 2.4/31.0& 4.8    82/68
 6    2.40   0    193.0      141.5    911/1148     6.2/ 8.7     15/ 6      28.8& 3.5/31.5& 4.9    76/68
 7    1.68   0    255.3      131.5    815/1101     2.3/ 6.6     14/ 5      27.1& 1.8/31.1& 5.7    86/63
 8    1.93   0    234.8      131.5    843/1125     5.2/ 7.1      3/ 8      28.1& 2.9/31.2& 4.6    79/70
 9    1.48   0    246.4      111.5    920/1155     3.4/ 5.2     13/15      28.8& 3.6/32.3& 4.8    75/69
10    1.59   0    210.8      102.5    901/1141     5.9/ 6.3     16/ 5      29.0& 3.6/31.5& 5.1    75/67
11    1.75   0    269.3      144.5    825/1108     3.1/ 3.8     14/13      27.4& 2.0/31.0& 5.2    85/66
```

```
RUN# 209    DATE:  7/21/74    COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF    RELAT
 #                           SODIUM   START/END    START/END   START/END         START/END          HUMID

 3    1.98   0    190.2      109.5    1053/1250    2.2/12.2     12/ 6      31.2& 5.4/31.9& 5.1    65/67
 4    6.97   0    135.2      288.5    1057/1255    1.0/13.9     15/ 7      31.4& 6.0/31.5& 3.7    62/75
 5    2.39   0    179.7      131.5    1119/1306    3.5/          8/ 6      31.0& 4.8/     &       68/
 6    2.73   0    198.6       90.9    1150/1332    8.7/          8/ 7      31.3& 4.7/     &       69/
 7    2.06   0    148.5       93.5    1104/1258    6.6/          6/ 7      31.1& 5.7/     &       63/
 8    0.17   2    151.7        8.1    1127/1311    7.1/          8/16      31.2& 4.6/     &       70/
 9    0.69   2    160.5       33.9    1159/1339    5.2/ 8.9      4/ 8      32.3& 4.8/31.9& 4.4    69/71
10    1.99   0    137.9       83.4    1144/1327    6.3/          4/ 7      31.5& 5.1/     &       67/
11    2.95   0    189.6      171.5    1111/1303    3.8/         13/ 8      31.0& 5.2/     &       66/
```

```
RUN# 210   DATE:  7/22/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM   START/END    START/END    START/END         START/END            HUMID

 3    1.68   0    197.3      101.3     824/1032     4.2/ 6.3       15/12      28.2& 2.9/29.5& 4.7      79/68
 4    1.35   0    200.7       83.2     835/1036     2.5/           15/12      28.4& 3.0/     &         79/
 5    1.34   0    179.9       73.7     901/1048     4.7/           13/14      28.8& 3.0/     &         79/
 6    1.96   0    103.9       62.4     943/1112     3.1/           15/ 3      29.4& 3.6/     &         75/
 7    1.28   0    189.7       74.2     842/1039     4.4/           15/11      28.5& 3.3/     &         77/
 8    1.26   0    162.3       62.4     911/1055     5.9/ 2.8       15/14      28.7& 2.8/30.6& 4.9      80/68
 9    1.19   0    139.7       50.9     949/1116     3.8/10.3       12/12      30.3& 4.2/28.0& 2.1      72/84
10    1.19   0    137.4       50.2     933/1109     3.8/           15/ 8      29.9& 3.7/     &         75/
11    1.21   0    188.8       69.7     853/1044     4.4/ 3.9       15/11      28.7& 3.5/30.0& 4.9      76/68
```

```
RUN# 211   DATE:  7/23/74   COOLING DEVICE CODE=1

ST    PHI    C    VOLUME      NET        TIME       WINDSPEED    WIND DIR.    DRY BULB TEMP & DIFF     RELAT
 #                           SODIUM   START/END    START/END    START/END         START/END            HUMID

 3    0.98   0    288.9       86.4     759/1106     1.5/ 8.2        1/ 4      26.2& 2.7/28.7& 3.1      80/78
 4    1.19   0    307.6      112.3     807/1114     1.8/11.2       12/ 6      26.8& 2.7/31.3& 4.7      80/69
 5    1.01   0    310.1       96.2     833/1140     5.6/ 9.8       12/ 6      27.2& 3.0/31.7& 5.4      78/65
 6    1.35   0    199.5       82.3     912/1212     0.2/ 9.3       13/ 6      29.0& 4.0/31.8& 5.7      72/64
 7    0.72   0    303.3       66.8     814/1121     2.1/ 8.9        1/ 7      27.1& 2.9/31.6& 5.6      79/64
 8    0.75   0    277.4       63.3     843/1149     0.8/ 9.7       13/10      28.3& 3.6/31.2& 4.3      75/71
 9    0.76   0    294.9       68.6     921/1221     1.3/ 7.2        2/ 4      30.4& 4.8/32.6& 5.9      68/63
10    0.77   0    254.8       59.8     904/1204     3.1/ 9.7        2/ 6      28.9& 4.0/32.6& 6.4      72/60
11    1.15   0    314.6      110.3     827/1133     3.4/11.1       14/ 7      27.7& 3.1/30.8& 5.2      78/66
```

```
RUN# 212   DATE:  7/23/74   COOLING DEVICE CODE=1

ST   PHI   C   VOLUME      NET       TIME      WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF   RELAT
 #                       SODIUM   START/END    START/END   START/END         START/END         HUMID

 3   1.28  0   171.6      67.3   1109/1304     8.2/ 9.8      6/ 6     28.7& 3.1/31.3& 5.3     78/66
 4   6.75  0   189.9     392.3   1117/1310    11.2/12.0      5/ 5     31.3& 4.7/31.0& 4.5     69/70
 5   1.40  0   180.0      77.3   1143/1329     9.8/12.7      6/ 5     31.7& 5.4/31.8& 5.1     65/67
 6   1.14  0   167.2      58.6   1215/1410     9.3/ 7.4      6/ 8     31.8& 5.7/32.5& 5.1     64/68
 7   0.66  5     8.8       1.8   1127/1315     8.9/10.4      5/ 5     31.6& 5.6/31.7& 5.5     64/65
 8   0.72  0   159.9      35.1   1152/1337     9.7/12.1     10/10     31.2& 4.3/31.7& 4.3     71/72
 9   0.82  0   188.5      47.3   1224/1419     7.2/14.2      4/ 6     32.6& 5.9/32.8& 6.2     63/61
10   0.74  0   157.4      35.8   1233/1401     9.7/13.2      9/ 5     32.6& 6.4/32.1& 5.3     60/66
11   2.86  0   179.4     157.3   1135/1324    11.1/11.6      7/ 8     30.8& 5.2/32.1& 5.2     66/67
```

Low RPM on Station 7.

```
RUN# 213   DATE:  7/24/74   COOLING DEVICE CODE=1

ST   PHI   C   VOLUME      NET       TIME      WINDSPEED   WIND DIR.    DRY BULB TEMP & DIFF   RELAT
 #                       SODIUM   START/END    START/END   START/END         START/END         HUMID

 3   0.84  0   194.8      49.9    832/1035     2.5/ 7.0     16/ 8     28.6& 3.6/31.2& 4.2     75/72
 4   2.14  0   183.3     120.3    843/1042     3.0/ 6.8     16/ 6     29.0& 3.6/31.5& 4.3     75/72
 5   0.93  0   172.4      49.1    912/1056     1.4/         15/ 5     29.4& 3.6/     &        75/
 6   0.96  0   137.7      40.4    949/1121     3.5/12.2      1/ 8     31.0& 4.4/31.1& 3.9     71/74
 7   0.67  0   182.1      37.4    852/1048     3.7/ 9.5     16/ 5     28.2& 3.4/31.4& 4.2     76/72
 8   0.69  0   153.3      32.6    921/1101     1.4/         14/ 8     29.5& 4.3/     &        71/
 9   1.20  0   145.8      53.6    957/1130     6.0/13.0      3/ 3     31.0& 4.3/31.6& 4.4     71/71
10   0.64  0   142.4      28.1    941/1112     1.7/13.2     16/ 5     30.3& 4.6/31.6& 4.6     69/70
11   0.90  0   183.9      50.9    904/1053     3.5/12.2     16/ 7     29.4& 3.2/31.1& 3.5     78/76
```

```
RUN# 214    DATE:  7/24/74    COOLING DEVICE CODE=1

ST    PHI    C    VOLUME       NET         TIME        WINDSPEED     WIND DIR.     DRY BULB TEMP & DIFF     RELAT
 #                            SODIUM    START/END      START/END     START/END          START/END            HUMID

 3    0.76   0    113.5        26.4     1258/1412       4.6/ 5.8        4/ 8      31.3& 4.3/32.5& 4.4     71/72
 4    6.29   0    100.4       193.3     1302/1416       3.7/11.6       10/ 6      31.6& 4.2/31.7& 4.5     72/71
 5    0.77   0    119.1        27.9     1321/1430       7.0/ 8.1        8/ 7      32.2& 5.2/32.5& 5.4     67/66
 7    0.93   0    133.3        28.5     1304/1421       4.9/10.4        8/ 5      31.7& 5.5/31.5& 4.4     65/71
10    0.53   0     99.1        17.6     1333/1445      10.3/ 7.7        6/ 6      32.8& 6.6/32.7& 5.7     59/64
11    1.44   0    123.7        54.4     1314/1426      12.2/ 8.6        8/ 7      31.6& 5.2/31.5& 4.0     67/73


RUN# 215    DATE:  7/24/74    COOLING DEVICE CODE=1

ST    PHI    C    VOLUME       NET         TIME        WINDSPEED     WIND DIR.     DRY BULB TEMP & DIFF     RELAT
 #                           -SODIUM    START/END      START/END     START/END          START/END            HUMID

 3    0.92   0     92.2        25.9     1417/1516       5.8/ 8.1        8/ 7      32.5& 4.4/31.7& 4.7     72/70
 4    5.92   0     76.3       138.3     1420/1539      11.6/ 9.3        6/ 7      31.7& 4.5/31.0& 3.8     71/74
 5    0.56   0    191.4        32.6     1434/1550       9.1/11.1        7/ 5      32.5& 5.4/32.0& 4.5     66/71
 7    0.85   0     89.0        23.1     1425/1543      10.4/ 7.4        5/ 5      31.5& 4.4/31.5& 4.8     71/69
10    0.75   0    102.9        23.6     1440/1600       7.7/10.6        6/ 8      32.7& 5.7/32.3& 5.6     64/65
11    1.12   0    132.2        45.4     1429/1546       3.6/11.5        7/ 6      31.5& 4.0/31.5& 3.8     73/75
```

APPENDIX C-2

APS PROCEDURAL BACKGROUND DATA

Date	Procedural Background (μg of Sodium)
08/24/73	2.0
08/27/73	2.42
08/28/73	7.72
09/04/73	0.65
09/05/73	1.08
09/06/73	0.60
09/10/73	0.80
09/11/73	2.90
09/12/73	0.57
09/13/73	0.57
09/14/73	0.25
09/17/73	7.83
09/18/73	7.30
09/19/73	13.0
09/20/73	13.1
09/21/73	6.73
09/24/73	40.20
09/25/73	17.00
09/26/73	1.68
09/27/73	28.30
09/28/73	1.85
10/01/73	0.13
10/02/73	0.36
10/03/73	0.78
10/08/73	0.61

APS PROCEDURAL BACKGROUND DATA (cont.)

Date	Procedural Background (μg of Sodium)
10/09/73	0.48
10/10/73	1.28
10/12/73	0.96
10/15/73	1.42
10/16/73	3.92
10/17/73	2.62
10/18/73	2.42
10/22/73	4.06
10/23/73	6.33
10/24/73	7.90
10/25/73	11.0
10/26/73	7.20
10/29/73	2.70
10/30/73	3.12
10/31/73	7.95
11/02/73	2.38
11/05/73	3.00
11/06/73	4.52
11/07/73	3.33
11/09/73	2.92
11/10/73	8.42
11/13/73	2.53
11/14/73	5.38
11/15/73	3.60
11/16/73	6.43
11/20/73	4.58
11/21/73	3.13
11/27/73	6.10
11/30/73	13.60
12/01/73	5.63
12/05/73	2.95
12/06/73	1.55
12/11/73	2.53
12/13/73	0.29
12/14/73	0.75

APS PROCEDURAL BACKGROUND DATA (cont.)

Date	Procedural Background (μg of Sodium)
12/17/73	0.67
12/18/73	0.56
01/02/74	0.37
01/04/74	0.53
01/08/74	0.56
01/09/74	3.40
01/11/74	0.63
02/01/74	70.80
02/02/74	43.63
02/06/74	10.8
02/08/74	3.86
02/11/74	1.11
02/12/74	2.56
02/13/74	7.31
02/14/74	14.8
02/15/74	1.41
02/18/74	1.21
02/19/74	0.36
02/20/74	2.45
02/21/74	2.85
02/22/74	2.33
02/23/74	0.60
02/25/74	1.58
02/26/74	3.73
02/27/74	1.73
02/28/74	2.53
03/01/74	2.40
03/07/74	2.10
03/08/74	3.60
02/11/74	2.13
03/12/74	2.48
03/13/74	0.98
03/14/74	20.30
03/15/74	1.35
03/18/74	3.68

APS PROCEDURAL BACKGROUND DATA (cont.)

Date	Procedural Background (μg of Sodium)
03/19/74	0.68
03/21/74	1.33
03/22/74	10.10
03/25/74	0.13
03/26/74	0.28
03/27/74	0.98
03/30/74	1.48
03/31/74	0.48
04/03/74	0.35
04/04/74	0.60
04/08/74	12.40
04/09/74	2.65
04/10/74	0.38
04/11/74	1.03
04/16/74	16.40
04/17/74	0.19
04/18/74	2.24
04/19/74	8.66
04/20/74	17.70
04/22/74	12.50
04/23/74	1.81
04/24/74	0.29
04/25/74	1.74
04/26/74	1.57
04/28/74	0.43
04/29/74	0.80
04/30/74	0.75
05/01/74	0.33
05/02/74	1.20
05/03/74	1.91
05/04/74	1.88
05/06/74	3.48
05/07/74	0.61
05/08/74	1.98
05/09/74	2.13

APS PROCEDURAL BACKGROUND DATA (cont.)

Date	Procedural Background (μg of Sodium)
05/10/74	1.78
05/11/74	3.45
05/13/74	2.78
05/14/74	1.85
05/15/74	2.90
05/16/74	2.28
05/17/74	2.53
05/20/74	3.68
05/21/74	17.10
05/22/74	3.10
05/23/74	7.28
05/24/74	2.40
05/27/74	2.33
05/28/74	2.98
05/29/74	1.58
05/30/74	2.40
05/31/74	4.18
06/03/74	0.45
06/04/74	0.20
06/05/74	0.41
06/06/74	1.28
06/07/74	0.23
06/08/74	4.05
06/10/74	2.40
06/11/74	3.63
06/12/74	1.73
06/13/74	2.63
06/14/74	1.59
06/15/74	1.86
06/17/74	1.60
06/18/74	3.21
06/19/74	1.80
06/20/74	2.50
06/21/74	15.30
06/22/74	7.63

APS PROCEDURAL BACKGROUND DATA (cont.)

Date	Procedural Background (μg of Sodium)
06/22/74	1.81
06/25/74	0.38
06/27/74	1.38
06/28/74	0.28
06/29/74	2.08
07/01/74	1.28
07/02/74	0.43
07/03/74	1.10
07/06/74	1.98
07/08/74	1.25
07/09/74	3.33
07/10/74	1.15
07/11/74	0.99
07/12/74	7.08
07/13/74	10.10
07/15/74	1.70
07/16/74	2.04
07/18/74	1.04
07/19/74	11.40
07/20/74	0.63
07/21/74	2.50
07/22/74	1.83
07/23/74	1.38

APPENDIX C-3

APS MESH BACKGROUND DATA

Date	Background (μg of Sodium)	Date	Background (μg of Sodium)	Date	Background (μg of Sodium)
08/06/73	0.28	01/15/74	0.23	04/08/74	11.7
	0.65		0.23		
	0.13		0.20	04/09/74	3.73
	1.30		0.27		
	0.48		0.13	04/10/74	0.28
	0.68				
	0.33			04/11/74	0.63
	1.53	03/12/74	1.98		
				04/16/74	8.6
		03/13/74	0.98	04/17/74	0.34
08/25/73	1.60				
				04/30/74	0.37
		03/14/74	2.35		0.92
					2.43
09/21/73	0.87	03/15/74	1.48		8.49
	0.50				0.73
	0.33				0.73
	0.52	03/18/74	3.68		0.09
	0.40				0.61
	0.20	03/27/74	0.98		0.44
	0.08				0.34
	0.37				0.02
	0.18	03/29/74	1.48		0.22
	0.05				0.32
		03/30/74	1.48		0.19
					0.22
		03/31/74	0.48		0.14
					0.47
12/21/73	1.36	04/03/74	0.93		0.27
	2.08				0.44
	1.12	04/04/74	1.53		0.42

APS MESH BACKGROUND DATA (cont.)

The following petri dishes containing each a mesh pair were submitted for background analysis on 10/23/74. After the analysis, each mesh pair was cleaned and placed in a new petri dish, whereupon they were re-analyzed for sodium background on 10/26/74. Subsequently, all mesh pairs were stored and several were analyzed at later dates to check accumulation of sodium on unopened mesh pairs.

Number	Background 10/24/73 (μg of Na)	Background after cleaning and reboxing 10/26/73 (μg of Na)	Background 12/31/73 (μg of Na)	Background 6/4/74 (μg of Na)
1	2.80	0.05	2.08	
2	6.38	0.05		1.90
3	1.52	0.73		1.93
4	2.15	0.05	7.30	
5	3.60	0.90	0.75	
6	5.20	0.13	3.18	
7	3.98	0.13		
8	4.62	0.05		
9	11.7	0.61		2.55
10	3.82	0.13		
11	16.6	0.13		2.70

Stewart Laboratories, Inc.

820 TULIP AVENUE — KNOXVILLE, TENNESSEE 37921
615—525-1123

April 3, 1974

Dr. Gunter O. Schrecker
Environmental Systems Corporation
Route 2
Alcoa, TN 37701

Dear Dr. Schrecker:

The enclosed report is for five (5) screens which were chosen for testing after a problem of unusually high blank values was discovered. Initial testing revealed an apparent solution to the problem in the use of the ultrasonic cleaner. All screens submitted after this initial work was completed were washed in the ultrasonic cleaner before being returned to Environmental Systems Corporation. Test #2 and Test #3 confirmed that washing after stripping the screens for analysis is the solution to the problem of high blank values.

In no case have we found the amount of sodium remaining on the screens after they are stripped for analysis to be significant in terms of the total amount of sodium present. However, the extra cleaning step has resulted in the more consistent blank levels and has eliminated the necessity for logging the history of each screen. The cleaning step has been incorporated into our routine handling of screens at no extra charge to Environmental Systems Corporation.

Sincerely,

STEWART LABORATORIES, INC.

Barry A. Stephenson
Manager of Administrative
Services

BAS/lpj

enclosures

Stewart Laboratories, Inc.

820 TULIP AVENUE • KNOXVILLE, TENNESSEE 37921

CERTIFICATE OF ANALYSIS

TO Dr. Gunter O. Schrecker
Environmental Systems Corporation
Route 3 - Municipal Airport
Alcoa, TN 37701

DATE REPORTED April 3, 1974
CODE: ESC - Experimental
ORDER No

Sample Description: Five (5) test screens

Concentration units are total micrograms

Stewart Laboratories Code	Sodium Original Analysis	Sodium Test #1*
1209	1525.	1.60
1210	1885.	3.45
1211	1675.	0.78
1212	2242.	0.43
1270	3150.	0.35

*Test #1 - Samples were cleaned using the ultrasonic cleaner prior to being processed for analysis a second time.

Sworn to and subscribed before me this 3rd
day of April 1974

NOTARY PUBLIC
My commission expires January 17, 1976

STEWART LABORATORIES, INC.

By Lynelle F. Jones

Stewart Laboratories, Inc.

820 TULIP AVENUE · KNOXVILLE TENNESSEE 37921

CERTIFICATE OF ANALYSIS

TO Dr. Gunter O. Schrecker
Environmental Systems Corporation

Page 2

DATE REPORTED April 3, 1974
CODE ESC - Experimental
ORDER No

Sample Description: Five (5) test screens

Concentration units are total micrograms

Stewart Laboratories Code	Test #2**	Sodium Test #3***		
		a	b	c
1209	0.07	0.33	0.13	0.17
1210	0.29	0.77	0.03	0.27
1211	0.39	0.70	0.33	0.20
1212	0.50	0.27	0.20	0.13
1270	0.07	0.20	0.23	0.13

**Test #2 - Screens were held for 2 weeks, cleaned in the ultrasonic cleaner, and analyzed as if they were samples.

***Test #3 - Screens were held for an additional week, cleaned in the ultrasonic cleaner, and analyzed as if they were samples. The process was repeated until a stable blank was established.

Sworn to and subscribed before me this 3rd
day of April 1974

NOTARY PUBLIC
My commission expires January 17, 1976

STEWART LABORATORIES, INC.

By Lynelle P. Jones

APPENDIX D

DEPOSITION DATA

FORMAT FOR DATA PRESENTATION - DEPOSITION DATA

Note: For more detailed descriptions of column headings, see text Section VI "Formats for Data Presentation".

ST #	Identification of deposition sampling station locations. (Concurs with APS location.)
DEP	Apparent sea salt deposition flux, $kg/km^2 \cdot month$.
C	Comment code: 0 - good run. 1 - sample caught in light rain. 2 - sample caught in heavy rain. 3 - possible contamination from insects in the funnel or bottle. 4 - possible contamination from dust. 5 - other comments or a combination of the coded comments; supplemented with a written footnote. 6 - possible contamination due to the presence of a tree frog in the funnel or bottle. 7 - contamination from bird excrement in the funnel and bottle.
NET SODIUM	Total sodium as verified by the chemical analysis minus the average procedural background, μg.
TIME	Time of day at the start and end of a run.

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```
RUN#   1   SPANNING FROM  9/ 5/1973TO  9/ 6/1973

ST.#       DEP      C       NET        TIME
                           SODIUM   START/END


  1       287.9     0      38.6     1229/1133
  4       200.5     0      61.4     1112/1009
  5       266.6     0      81.4     1055/ 948


RUN#   2   SPANNING FROM  9/12/1973TO  9/13/1973     PRECISION RUN ERROR=59.25

ST.#       DEP      C       NET        TIME
                           SODIUM   START/END


  1        15.4     0       4.9     1214/1158
  2        37.7     0      11.9     1216/1200
  3        10.0     0       3.2     1112/1057
  4        13.4     0       4.3     1047/1035
  5        15.6     0       5.0     1027/1010
  6        53.5     0      17.0     1514/1500

RUN#   3   SPANNING FROM  9/13/1973TO  9/14/1973     PRECISION RUN ERROR=56.36

ST.#       DEP      C       NET        TIME
                           SODIUM   START/END


  1        12.2     0       4.1     1158/1314
  2        24.0     0       9.4     1200/1317
  3        14.6     0       4.8     1057/1140
  4         8.7     0       2.8     1035/1104
  5        16.2     0       5.3     1010/1046
  6        39.1     0      11.2     1500/1225
```

```
RUN#    4   SPANNING FROM  9/17/1973TO  9/18/1973     PRECISION RUN ERROR=31.4%

ST.#       DEP      C        NET       TIME
                            SODIUM    START/END


  1        46.9     0       14.2      1423/1307
  2        32.2     0        9.8      1425/1309
  3        14.8     0        4.5      1346/1232
  4        17.7     0        5.4      1328/1213
  5      2563.8     0      776.2      1309/1154




RUN#    5   SPANNING FROM  9/18/1973TO  9/19/1973     PRECISION RUN ERROR=51.8%

ST.#       DEP      C        NET       TIME
                            SODIUM    START/END


  1        36.9     0       11.7      1307/1256
  2        76.5     0       24.3      1309/1258
  3        32.9     0       10.4      1232/1215
  4        26.5     0        8.4      1213/1154
  5        32.3     0       10.2      1154/1136
  6       204.8     6       51.4      1447/ 935
```

```
RUN#   6   SPANNING FROM  9/19/1973TO  9/20/1973      PRECISION RUN ERROR=13.9%

ST.#        DEP      C        NET        TIME
                            SODIUM    START/END


  1        171.9     1       51.5      1255/1123
  2        199.6     1       59.8      1258/1125
  3        122.6     1       36.5      1215/1035
  4        134.3     1       39.9      1154/1012
  5         98.3     1       23.2      1136/ 953
  6        140.5     6       54.5       935/1440




RUN#   7   SPANNING FROM  9/20/1973TO  9/21/1973      PRECISION RUN ERROR= 5.6%

ST.#        DEP      C        NET        TIME
                            SODIUM    START/END


  1        234.8     0       76.2      1123/1142
  2        221.6     0       71.9      1125/1144
  3        268.4     0       87.1      1035/1055
  4        156.4     0       50.7      1012/1030
  5        140.4     0       45.5       953/1009
  6        369.1     0      103.9      1440/1146
```

```
RUN#   8   SPANNING FROM  9/25/1973TO  9/26/1973

ST.#      DEP     C      NET      TIME
                        SODIUM   START/END


  3      265.7    1      84.4    1137/1126
  4      288.3    1      87.9    1123/1015
  5      240.0    1      72.7    1108/ 950
  6      424.7    1     113.3    1445/1045



RUN#   9   SPANNING FROM  9/26/1973TO  9/27/1973     PRECISION RUN ERROR=10.7%

ST.#      DEP     C      NET      TIME
                        SODIUM   START/END


  1      222.9    1      73.3    1224/1303
  2      199.1    1      65.5    1226/1305
  3      124.4    1      41.4    1126/1223
  4      260.5    0      87.1    1015/1119
  5      224.7    0      75.0     950/1051
  6      328.3    0     102.7    1045/1012
```

```
RUN#  10   SPANNING FROM  9/27/1973TO  9/28/1973     PRECISION RUN ERROR=45.96

ST.#       DEP      C        NET       TIME
                           SODIUM   START/END


  1       674.5     1      207.3     1303/1205
  2       364.6     1      112.0     1305/1207
  3       559.8     1      167.8     1223/1113
  4       809.8     1      253.7     1119/1048
  5       688.7     1      217.0     1051/1028
  6      1046.8     1      331.7     1012/ 957



RUN#  11   SPANNING FROM  9/28/1973TO 10/ 1/1973     PRECISION RUN ERROR= 5.38

ST.#       DEP      C        NET       TIME
                           SODIUM   START/END


  1       367.5     0      350.5     1205/1134
  2       348.0     0      331.9     1207/1136
  3       337.6     0      322.7     1113/1052
  4       342.5     0      328.1     1048/1035
  5       362.1     0      346.7     1028/1014
  6       316.3     0      324.8      957/1455
```

```
RUN#  12   SPANNING FROM 10/ 1/1973TO 10/ 2/1973     PRECISION RUN ERROR= 3.8%

ST.#      DEP      C      NET       TIME
                         SODIUM   START/END


  1      442.1     1     146.7     1134/1226
  2      459.3     1     152.5     1136/1229
  3      474.8     0     158.0     1052/1148
  4      538.3     0     178.8     1035/1129
  5      505.9     0     168.6     1014/1113




RUN#  13   SPANNING FROM 10/ 2/1973TO 10/ 3/1973     PRECISION RUN ERROR=10.4%

ST.#      DEP      C      NET       TIME
                         SODIUM   START/END


  1      253.4     0      80.8     1226/1221
  2      227.0     0      72.4     1229/1224
  3      304.3     0      95.7     1148/1123
  4      344.5     0     108.1     1129/1100
  5      195.3     0      61.2     1113/1043
```

```
RUN#  14   SPANNING FROM 10/ 3/1973TO 10/ 4/1973

ST.#       DEP      C       NET       TIME
                          SODIUM    START/END


  3       147.5     2      49.6     1123/1235
  4       232.9     1      78.1     1100/1208
  5       207.0     1      66.0     1043/1038




RUN#  15   SPANNING FROM 10/ 8/1973TO 10/ 9/1973     PRECISION RUN ERROR=17.3%

ST.#       DEP      C       NET       TIME
                          SODIUM    START/END


  1        64.2     0      19.2     1528/1353
  2        77.6     0      23.3     1534/1403
  3        61.0     0      19.2     1332/1307
  4        52.0     0      16.4     1305/1246
  5        46.0     0      15.6     1103/1225
  6       260.5     0      79.6     1226/1120
```

```
RUN#  16   SPANNING FROM 10/ 9/1973TO 10/10/1973     PRECISION RUN ERROR=34.6%

ST.#      DEP     C      NET       TIME
                        SODIUM   START/END


  1      140.2    1      44.4     1400/1344
  2       91.7    1      28.9     1406/1345
  3      201.0    1      64.0     1313/1305




RUN#  17   SPANNING FROM 10/10/1973TO 10/11/1973

ST.#      DEP     C      NET       TIME
                        SODIUM   START/END


  3      866.3    1     287.6     1308/1402
  4     1672.2    1     559.3     1241/1345
  5     1225.8    1     409.4     1216/1316
  6     1974.0    1     556.6     1434/1142
```

```
RUN#  18    SPANNING FROM 10/11/1973TO 10/12/1973

ST.#        DEP       C        NET       TIME
                              SODIUM   START/END


  3      1450.8       1      434.6     1407/1234
  5       759.1       1      227.0     1323/1148




RUN#  19    SPANNING FROM 10/12/1973TO 10/15/1973

ST.#        DEP       C        NET       TIME
                              SODIUM   START/END


  2       492.2       0      479.6     1320/1422
  3       494.7       0      480.3     1238/1325
  4       596.5       0      578.0     1217/1255
  5       467.4       0      453.2     1153/1233
  6       364.2       0      353.2     1118/1159
```

```
RUN#  20   SPANNING FROM 10/15/1973TO 10/16/1973

ST.#       DEP      C       NET        TIME
                          SODIUM    START/END


  2       123.5     0      38.2      1429/1342
  3       163.0     0      51.2      1330/1304
  4       216.1     0      68.3      1302/1244
  5       107.2     0      33.8      1240/1216
  6       106.8     0      33.5      1206/1137
```

```
RUN#  21   SPANNING FROM 10/16/1973TO 10/17/1973

ST.#       DEP      C       NET        TIME
                          SODIUM    START/END


  2        44.8     0      14.1      1349/1324
  3        68.6     0      21.5      1303/1238
  4        59.7     0      18.7      1249/1214
  5        45.7     0      14.4      1222/1156
  6        39.9     0      12.5      1142/1105
```

```
RUN# 22   SPANNING FROM 10/17/1973TO 10/18/1973     PRECISION RUN ERR

ST.#       DEP       C       NET        TIME
                            SODIUM    START/END

  1       256.7      0       75.5      1333/1136
  2       177.6      0       52.0      1329/1145
  3       148.0      0       43.9      1232/1145
  4       206.5      0       61.3      1217/1033
  5       133.7      0       38.7      1203/1012
  6       115.9      0       34.2      1136/ 918




RUN#  23   SPANNING FROM 10/18/1973TO 10/19/1973     PRECISION RUN ERROR=71.56

ST.#       DEP       C       NET        TIME
                            SODIUM    START/END

  1       252.9      1       82.9      1141/1215
  2       866.8      1      289.6      1143/1218
  3       551.5      1      192.8      1058/1310
  5       771.3      2      279.6      1015/1325
  6       738.8      2      271.4       921/1253
```

```
RUN#  24   SPANNING FROM 10/22/1973TO 10/23/1973      PRECISION RUN ERROR= 1.3%

ST.#       DEP      C       NET       TIME
                           SODIUM   START/END


  1        785.6    0      247.2    1300/1235
  2        795.9    0      250.8    1303/1240
  3        556.5    0      192.1    1139/1211
  4        881.8    0      290.2    1110/1150
  5       1032.7    1      340.6    1051/1135
  6        991.7    1      315.1    1005/ 954



RUN#  25   SPANNING FROM 10/23/1973TO 10/24/1973      PRECISION RUN ERROR= 2.8%

ST.#       DEP      C       NET       TIME
                           SODIUM   START/END


  1        279.8    0       86.3    1239/1147
  2        287.8    0       69.0    1243/1153
  3        291.2    0       88.8    1215/1107
  4        478.0    1      146.5    1153/1049
  5        504.0    1      154.1    1139/1032
  6        368.3    0      117.0     959/ 957
```

```
RUN # 26   SPANNING FROM 10/24/1973TO 10/25/1973     PRECISION RUN ERROR=27.1%

ST.#      DEP      C      NET       TIME
                         SODIUM   START/END

  1      238.4     0      77.6    1152/1216
  2      173.7     0      56.6    1156/1222
  3      155.1     0      50.7    1109/1138
  4      218.4     0      73.6    1053/1108
  5      158.0     0      51.0    1035/1048
  6      188.7     0      61.0    1001/1015


RUN #  27   SPANNING FROM 10/25/1973TO 10/26/1973     PRECISION RUN ERROR=15.4%

ST.#      DEP      C      NET       TIME
                         SODIUM   START/END

  1      183.9     0      69.5    1222/1642
  2      217.4     0      82.1    1226/1645
  3      151.9     0      48.0    1132/1113
  4      178.6     0      56.8    1110/1100
  5      156.5     0      50.1    1051/1050
  6      183.2     0      60.8    1016/1135
```

```
RUN#  28   SPANNING FROM 10/26/1973TO 10/29/1973     PRECISION RUN ERROR= 4.6%

ST.#        DEP      C        NET        TIME
                             SODIUM    START/END


  1        117.4     0      105.0      1645/1147
  2        112.1     0      100.3      1648/1152
  3        102.5     0       97.0      1116/1012
  4        118.8     0      113.1      1103/1024
  5        100.6     0       95.7      1053/1035
  6        109.4     0      102.1      1138/ 937



RUN#  29   SPANNING FROM 10/29/1973TO 10/30/1973     PRECISION RUN ERROR=35.0%

ST.#        DEP      C        NET        TIME
                             SODIUM    START/END


  1        155.3     0       51.4      1152/1240
  2        101.0     0       33.4      1156/1245
  3         73.0     0       25.1      1015/1159
  4         75.3     0       25.4      1028/1143
  5         76.9     0       25.0      1040/1100
  6         57.5     0       19.0       944/1030
```

```
RUN#   30    SPANNING FROM 10/30/1973TO 10/31/1973      PRECISION RUN ERROR=75.4%

ST.#      DEP      C       NET        TIME
                          SODIUM    START/END


  1      298.6     0       95.3     1245/1240
  2       73.5     0       23.5     1248/1245
  3       73.4     0       22.6     1202/1204
  4     5365.8     7     1004.5     1145/1101
  5       71.5     0       22.5     1103/1040
  6       55.4     0       17.4     1034/1038



RUN#   31    SPANNING FROM 10/31/1973TO 11/ 2/1973      PRECISION RUN ERROR= 5.1%

ST.#      DEP      C       NET        TIME
                          SODIUM    START/END


  1       80.6     1       49.8     1245/1058
  2       85.2     1       52.6     1248/1107
  3       78.5     1       47.8     1237/ 943
  4     4007.5     7     2425.7     1104/ 826
  5       34.0     0       21.8     1043/1040
```

```
RUN#  32   SPANNING FROM 11/ 2/1973TO 11/ 5/1973     PRECISION RUN ERROR= 2.8%

ST.#       DEP       C        NET        TIME
                             SODIUM    START/END


  1       105.9      0      100.6      1107/1026
  2       102.9      0       98.0      1110/1030
  3        64.3      0       61.4       946/ 921
  4      5347.7      7     5161.0       830/ 650
  5        83.9      0       61.1       804/ 630



RUN#  33   SPANNING FROM 11/ 5/1973TO 11/ 6/1973     PRECISION RUN ERROR=13.5%

ST.#       DEP       C        NET        TIME
                             SODIUM    START/END


  1       259.2      0       66.8      1030/1136
  2       224.2      0       75.1      1034/1140
  3       238.9      0       65.0       924/1320
  4       342.3      0      139.8       854/1530
  5       207.3      0       86.1       833/1540
```

```
RUN#  34    SPANNING FROM 11/ 6/1973TO 11/ 7/1973     PRECISION RUN ERROR= 1.3%

ST.#        DEP       C        NET         TIME
                               SODIUM    START/END


  1        623.5      0      201.7       1140/1155
  2        615.1      0      199.3       1143/1200
  3        779.0      1      228.3       1322/1120
  4       1407.3      1      368.3       1532/1109
  5       1059.1      1      268.2       1543/1042



RUN#  35    SPANNING FROM 11/ 7/1973TO 11/ 9/1973     PRECISION RUN ERROR=32.3%

ST.#        DEP       C        NET         TIME
                               SODIUM    START/END


  1        394.9      0      244.3       1200/1022
  2        267.3      0      165.5       1203/1028
  3        359.7      0      221.8       1129/ 942
  4      15970.7      7     9348.0       1111/ 924
  5        306.7      0      189.7       1045/ 907
```

```
RUN#  36   SPANNING FROM 11/ 9/1973TO 11/12/1973      PRECISION RUN ERROR= 9.8%

ST.#        DEP       C       NET        TIME
                            SODIUM    START/END


  1        495.1      0      485.0     1028/1154
  2        446.7      0      437.8     1031/1158
  3        501.5      0      492.6      945/1124
  4       6313.0      7     6195.0      927/1100
  5        391.7      1      384.0      910/1038



RUN#  37   SPANNING FROM 11/12/1973TO 11/13/1973      PRECISION RUN ERROR=34.4%

ST.#        DEP       C       NET        TIME
                            SODIUM    START/END


  1        529.7      0      168.7     1158/1150
  2        347.6      0      110.9     1201/1156
  3        543.4      0      171.2     1126/1105
  4        758.0      0      238.7     1105/1041
  5        535.1      1      166.6     1041/1018
```

```
RUN#  38    SPANNING FROM 11/13/1973TO 11/14/1973      PRECISION RUN ERROR=17.74

ST.#       DEP      C       NET      TIME
                          SODIUM   START/END


  1       344.4     0     120.1     1156/1404
  2       283.3     0      96.6     1200/1409
  3       405.6     1     148.0     1106/1429
  4      7590.9     7    2835.0     1043/1443
  5       286.8     0     109.2     1021/1454




RUN#  39    SPANNING FROM 11/14/1973TO 11/15/1973      PRECISION RUN ERROR=31.98

ST.#       DEP      C       NET      TIME
                          SODIUM   START/END


  1      1289.5     0     400.3     1409/1325
  2       874.3     0     272.8     1412/1329
  3      1458.7     0     455.4     1431/1355
  4      1206.9     0     359.0     1445/1306
  5      1373.0     0     409.7     1457/1319
```

```
RUN#  40   SPANNING FROM 11/15/1973TO 11/20/1973      PRECISION RUN ERROR=27.28

ST.#      DEP      C      NET       TIME
                         SODIUM   START/END


  1      692.5     1    1137.4     1329/1635
  2      504.0     1     828.0     1332/1440
  3      543.0     0     865.0     1359/1608
  5      545.3     0     669.4     1323/1538
```

```
RUN#  41   SPANNING FROM 11/20/1973TO 11/21/1973      PRECISION RUN ERROR=13.94

ST.#      DEP      C      NET       TIME
                         SODIUM   START/END


  1     3167.0     1     950.7     1640/1510
  2     2728.0     1     619.6     1643/1514
  3     1390.0     0     433.3     1611/1533
  4     1987.9     0     549.5     1556/1544
  5     1325.0     0     429.0     1542/1557
  6     3318.9     0    1031.0     1511/1428
```

```
RUN#  42    SPANNING FROM 11/21/1973TO 11/27/1973      PRECISION RUN ERROR=11.9%

ST.#        DEP      C       NET        TIME
                            SODIUM    START/END


  1        166.3     0      316.3      1514/1349
  2        146.4     0      278.5      1518/1353
  3        113.5     0      214.8      1534/1322
  4        123.4     0      232.5      1550/1307
  5        131.3     0      246.7      1600/1248
  6        142.4     0      264.3      1432/1218




RUN#  43    SPANNING FROM 11/27/1973TO 11/30/1973      PRECISION RUN ERROR= 5.8%

ST.#        DEP      C       NET        TIME
                            SODIUM    START/END


  1        289.5     1      269.1      1353/1133
  2        307.2     1      285.6      1357/1137
  3        263.7     1      244.4      1325/1053
  4       1223.7     7     1132.5      1310/1032
  5        173.4     2      160.5      1250/1012
  6        302.3     2      279.1      1221/ 933
```

```
RUN#  44   SPANNING FROM 11/30/1973TO 12/ 1/1973      PRECISION RUN ERROR=12.78

ST.#       DEP      C       NET       TIME
                          SODIUM   START/END


  1       368.2     0     132.6     1137/1437
  2       321.4     0     115.8     1141/1441
  3       329.8     0     110.4     1055/1200
  4      5919.9     7    1974.6     1036/1136
  5       314.2     0     105.1     1015/1119
  6       336.7     0     120.8      936/1230



RUN#  45   SPANNING FROM 12/ 1/1973TO 12/ 4/1973      PRECISION RUN ERROR=23.78

ST.#       DEP      C       NET       TIME
                          SODIUM   START/END


  1       270.3     0     249.4     1441/1151
  2       206.3     0     190.5     1444/1156
  3       234.9     0     223.0     1204/1113
  4       370.4     0     349.0     1141/1018
  5       206.6     0     194.2     1122/ 945
  6       210.8     0     207.4     1232/1228
```

```
RUN#  46   SPAWNING FROM 12/ 4/1973TO 12/ 5/1973     PRECISION RUN ERROR= 7.08

ST.#       DEP      C        NET       TIME
                            SODIUM   START/END


  1       329.1     0      123.2     1156/1600
  2       306.1     0      114.6     1203/1603
  3       270.1     0      102.1     1116/1535
  4       238.9     0       92.8     1023/1526
  5       350.8     0      137.6      952/1516
  6       300.4     0       97.1     1230/1244




RUN#  47   SPAWNING FROM 12/ 5/1973TO 12/ 6/1973     PRECISION RUN ERROR=32.38

ST.#       DEP      C        NET       TIME
                            SODIUM   START/END


  1       174.9     0       56.4     1603/1522
  2       257.2     0       80.0     1606/1525
  3       229.9     0       63.2     1539/1215
  4       199.4     0       52.2     1524/1106
  5       159.0     0       49.0     1519/1046
  6       206.4     0       58.8     1247/1309
```

```
RUN#  48   SPANNING FROM 12/ 6/1973TO 12/11/1973     PRECISION RUN ERROR=29.9%

ST.#      DEP      C      NET        TIME
                         SODIUM    START/END

  1      156.7     2     249.2     1525/1438
  2      109.8     2     174.5     1528/1437
  3      128.1     2     209.7     1217/1500
  4     1137.9     7    1838.6     1110/1533
  5      151.3     2     252.4     1048/1551
  6      238.9     2     351.1     1012/1639


RUN#  49   SPANNING FROM 12/11/1973TO 12/13/1973

ST.#      DEP      C      NET        TIME
                         SODIUM    START/END

  1       40.8     0      27.8     1443/1741
  3       41.7     0      27.7     1504/1650
  4      125.2     0      61.2     1536/1613
  5       63.2     0      44.9     1556/1637
  6      176.1     0      97.5     1613/ 943
```

```
RUN#  50   SPANNING FROM 12/13/1973TO 12/14/1973

ST.#       DEP      C       NET       TIME
                          SODIUM   START/END


  1        57.6     0      16.5     1713/1444
  3       115.3     0      34.3     1653/1510
  4        50.9     0      15.7     1613/1523
  5        25.2     0       7.7     1643/1535
  6        34.5     0      14.3      947/1645




RUN#  51   SPANNING FROM 12/14/1973TO 12/17/1973

ST.#       DEP      C       NET       TIME
                          SODIUM   START/END


  1       164.4     0     149.8     1449/ 928
  3       573.2     0     145.3     1512/1000
  4      3383.3     7    3017.6     1526/1017
  5       209.0     1     136.8     1539/1038
  6       290.8     1     257.1     1643/1103
```

```
RUN#  52   SPANNING FROM 12/17/1973TO 12/19/1973

ST.#      DEP      C       NET        TIME
                          SODIUM    START/END


  1      262.5     0     180.6       932/1306
  3      267.6     0     181.8      1002/1258
  4      401.1     0     270.6      1019/1253
  5      253.2     0     169.4      1040/1249
  6      331.6     0     219.2      1105/1238



RUN#  53   SPANNING FROM  1/ 2/1974TO  1/ 4/1974

ST.#      DEP      C       NET        TIME
                          SODIUM    START/END


  1      492.9     0     314.0      1304/1249
  3      358.4     0     227.5      1206/1140
  6      379.8     0     241.4      1233/1211
```

```
[illegible]  54   SPANNING FROM  17 6/1974TO  17 6/1974

ST.#        DEP       C       NET        TIME
                             SODIUM    START/END

  1        234.1      1      310.6     1253/1620
  3        134.6      1      180.1     1143/1602
  5        297.1      3      392.0     1214/1518
```

```
[illegible]  55   SPANNING FROM  17 8/1974TO  17 9/1974

ST.#        DEP       C       NET        TIME
                             SODIUM    START/END

  1         40.6      0       25.5     1623/1609
  3         63.5      0       22.7     1605/1524
  4        115.5      0       35.5     1553/1513
  5         89.0      3       27.7     1543/1502
  6         94.7      0       12.4     1521/1544
```

```
RUN#  56   SPANNING FROM  1/ 9/1974TO  1/11/1974

ST.#       DEP      C       NET        TIME
                            SODIUM   START/END


  1       177.1     0     112.6      1612/1552
  3       110.4     0      70.9      1526/1536
  4       132.6     0      85.2      1516/1525
  5        84.7     0      54.4      1505/1514
  6       141.2     0      88.5      1547/1445
```

```
RUN#  57   SPANNING FROM  2/ 6/1974TO  2/ 8/1974

ST.#       DEP      C       NET        TIME
                            SODIUM   START/END


  3       213.8     0     140.6      1520/1637
  4       192.2     0     125.0      1527/1612
  5       167.8     0     107.5      1548/1550
  6       240.6     0     145.9      1703/1430
  7       332.8     0     214.8      1538/1600
  8       558.4     0     354.7      1630/1536
  9       195.0     1     119.2      1623/1417
 10       233.4     0     141.6      1714/1443
```

```
RUN#  58   SPANNING FROM  2/ 8/1974TO  2/11/1974

ST.#        DEP      C       NET        TIME
                            SODIUM    START/END

  3         56.5     0        52.5     1639/1426
  4       3736.1     7      3507.6     1615/1437
  5         69.3     0        65.8     1553/1503
  6        149.0     0       143.7     1433/1450
  7         62.9     0        59.3     1604/1448
  8         68.6     0        65.6     1539/1518
  9        127.0     0       125.8     1421/1636
 10         60.4     0        59.9     1446/1704
```

```
RUN#  59   SPANNING FROM  2/11/1974TO  2/13/1974

ST.#        DEP      C       NET        TIME
                            SODIUM    START/END

  3        149.3     0        96.4     1423/1446
  4       4584.4     7      2953.3     1440/1457
  5         71.2     0        45.8     1506/1518
  6        155.0     0       102.1     1452/1613
  7         21.6     0        13.9     1451/1507
  8         58.4     0        37.5     1521/1529
  9         38.6     0        24.4     1639/1600
 10         21.4     0        13.5     1707/1626
```

```
RUN#  60    SPANNING FROM  2/13/1974TO  2/14/1974

ST.#       DEP       C       NET       TIME
                            SODIUM    START/END


  3        99.6      0       31.9     1448/1449
  4     19982.0      7     6402.9     1500/1501
  5        48.4      0       15.5     1521/1520
  6        71.0      0       23.1     1615/1636
  7        75.3      0       24.2     1509/1511
  8        48.5      0       15.5     1531/1531
  9        53.0      0       17.2     1603/1624
 10        85.4      0       27.7     1629/1647
```

```
RUN#  61    SPANNING FROM  2/14/1974TO  2/15/1974

ST.#       DEP       C       NET       TIME
                            SODIUM    START/END


  3        57.5      0       18.8     1452/1523
  4      7386.9      7     2413.0     1504/1533
  5       110.5      0       36.2     1523/1558
  6        91.3      0       28.9     1639/1622
  7       146.8      0       48.0     1513/1545
  8        44.2      0       14.5     1533/1612
  9        50.9      0       16.8     1626/1708
 10        65.2      0       21.7     1649/1744
```

```
RUN#  62   SPANNING FROM  2/15/1974TO  2/18/1974

ST.#       DEP       C        NET        TIME
                            SODIUM    START/END


  3        56.0      0        53.5     1525/1505
  4      6568.4      7      6391.0     1536/1526
  5       260.1      7       249.4     1601/1552
  6       103.6      0       100.6     1625/1713
  7        74.2      0        71.2     1548/1538
  8        64.3      0        61.7     1615/1607
  9        74.2      0        71.6     1710/1726
 10        74.9      0        71.2     1747/1702
```

```
RUN#  63   SPANNING FROM  2/18/1974TO  2/19/1974

ST.#       DEP       C        NET        TIME
                            SODIUM    START/END


  3       151.3      0        48.1     1508/1458
  4     12371.6      7      3901.0     1530/1508
  5       189.8      0        59.8     1555/1532
  6       209.6      0        65.2     1716/1635
  7       136.0      0        42.9     1541/1519
  8       212.4      0        67.0     1609/1547
  9       180.5      0        56.2     1728/1646
 10       223.3      0        66.4     1706/1523
```

```
RUN#  64   SPANNING FROM  2/19/1974TO  2/20/1974

ST.#       DEP      C       NET      TIME
                          SODIUM   START/END


  3       123.6     0      43.3     1501/1717
  4      6438.4     7    2166.2     1512/1639
  5       115.3     0      37.9     1534/1612
  6       283.3     0      64.6     1638/1501
  7       139.4     0      40.7     1522/1627
  8       124.2     0      39.9     1550/1557
  9       110.1     0      32.2     1650/1445
 10        97.1     0      31.0     1526/1521
```

```
RUN#  65   SPANNING FROM  2/20/1974TO  2/21/1974

ST.#       DEP      C       NET      TIME
                          SODIUM   START/END


  3       134.9     0      29.2     1720/1413
  4      1292.1     0     374.6     1642/1436
  5       218.9     0      66.4     1615/1459
  6       119.4     0      40.5     1507/1632
  7       178.9     0      53.2     1630/1448
  8       243.1     0      75.5     1600/1517
  9       117.1     0      39.8     1448/1617
 10       153.4     0      51.8     1524/1644
```

```
RUN#  66   SPANNING FROM  2/21/1974TO  2/25/1974

ST.#        DEP      C       NET       TIME
                           SODIUM   START/END


  3        135.5     0      175.9     1416/1533
  5        119.1     0      154.3     1503/1608
  6        199.9     0      259.6     1635/1756
  7        136.6     0      177.0     1450/1558
  8        149.9     0      194.1     1520/1622
  9        118.7     0      155.0     1620/1813
 10        121.6     0      157.4     1642/1743




RUN#  67   SPANNING FROM  2/25/1974TO  2/26/1974

ST.#        DEP      C       NET       TIME
                           SODIUM   START/END


  3         30.7     0        9.6     1535/1502
  5         58.8     0       18.6     1611/1555
  6         12.3     0        3.9     1800/1738
  7         44.0     0       13.9     1600/1540
  8         62.1     0       19.7     1625/1611
  9         70.3     0       21.8     1813/1727
 10         44.4     0       14.2     1746/1749
```

```
RUN#  68   SPANNING FROM  2/26/1974TO  2/27/1974

ST.#       DEP       C       NET        TIME
                            SODIUM    START/END


  3       113.6      0       37.5      1505/1548
  5        89.3      0       27.1      1558/1444
  6       147.7      0       45.2      1741/1636
  7       105.7      0       32.8      1543/1458
  8       132.3      0       39.2      1614/1427
  9       265.2      0       82.6      1730/1651
 10       189.4      0       56.9      1753/1624
```

```
RUN#  69   SPANNING FROM  2/27/1974TO  2/28/1974

ST.#       DEP       C       NET        TIME
                            SODIUM    START/END


  3       915.9      1      230.9      1551/1045
  4      3185.8      7      835.9      1516/1058
  5       452.3      1      125.8      1447/1138
  6       593.0      0      167.9      1639/1740
  7        25.1      1        6.8      1502/1120
  8      1296.4      1      371.3      1430/1158
 10        24.2      0        8.2      1627/1756
```

```
RUN#  70   SPANNING FROM  2/28/1974TO  3/ 7/1974

ST.#       DEP      C      NET      TIME
                          SODIUM   START/END


  3      187.0      1      429.7    1047/1503
  5      188.7      1      433.1    1142/1543
  6      236.4      1      528.0    1743/1708
  7      219.5      1      504.2    1125/1532
  8      325.1      1      742.3    1202/1509
  9      366.1      7      821.5    1727/1738
 10      182.3      1      406.0    1759/1655




RUN#  71   SPANNING FROM  3/ 7/1974TO  3/ 8/1974

ST.#       DEP      C      NET      TIME
                          SODIUM   START/END


  3      134.7      0       43.5    1507/1518
  5      188.9      0       61.0    1546/1558
  6      483.8      0      163.8    1711/1833
  7      175.0      0       56.4    1534/1544
  8      244.2      0       78.8    1603/1614
  9      217.4      0       71.4    1742/1820
 10      160.7      0       55.3    1658/1844
```

```
RUN#  72   SPANNING FROM  3/ 8/1974TO  3/11/1974

ST.#       DEP      C       NET       TIME
                          SODIUM   START/END


  3        80.7     0      74.8     1521/1635
  4       398.0     7     369.8     1533/1657
  5       103.1     0     101.1     1601/1732
  6       398.5     6     369.6     1836/1607
  7       126.0     0     123.4     1546/1709
  8       144.2     0     141.4     1617/1748
  9       365.3     7     356.4     1823/1930
 10       407.3     0     375.8     1847/1556
```

```
RUN#  73   SPANNING FROM  3/11/1974TO  3/13/1974

ST.#       DEP      C       NET       TIME
                          SODIUM   START/END


  3        30.7     0      18.8     1539/1431
  4       192.5     0     117.4     1703/1443
  5        57.6     0      35.0     1735/1508
  7        36.8     0      22.9     1712/1557
  8        37.1     0      22.5     1751/1522
  9       305.0     7     182.2     1933/1619
```

```
RUN#  74   SPANNING FROM  3/13/1974TO  3/14/1974

ST.#      DEP     C      NET      TIME
                        SODIUM   START/END


  3       66.9    0      20.4     1434/1326
  4      168.4    0      51.8     1447/1350
  5       66.9    0      20.8     1511/1432
  7       79.4    0      23.3     1600/1401
  8      124.4    0      38.0     1525/1420




RUN#  75   SPANNING FROM  3/14/1974TO  3/19/1974

ST.#      DEP     C      NET      TIME
                        SODIUM   START/END


  3      180.5    1     295.2     1329/1603
  4      390.8    1     635.8     1353/1549
  5     3096.9    1    4993.4     1436/1527
  7     4276.9    1    6937.0     1404/1538
  8      206.1    1     332.3     1422/1513
```

```
RUN#  76   SPANNING FROM  3/14/1974TO  3/25/1974

ST.#       DEF      C        NET       TIME
                           SODIUM    START/END


  6       288.2     6      909.4     1611/1243
  9       112.0     7      352.3     1622/1225
 10       200.9     3      635.3     1630/1300




RUN#  77   SPANNING FROM  3/19/1974TO  3/25/1974

ST.#       DEF      C        NET       TIME
                           SODIUM    START/END


  3        61.3     0      112.9     1616/1025
  4       100.1     0      135.4     1552/1044
  5        80.3     0      150.5     1529/1157
  7        56.0     0      104.0     1541/1100
  8        58.8     0      110.2     1517/1141
```

```
RUN#  78   SPANNING FROM  3/25/1974TO  3/26/1974

ST.#       DEP      C       NET       TIME
                          SODIUM    START/END

  3        93.9     0      30.3     1028/1036
  4       117.1     0      37.9     1046/1101
  5        80.9     0      25.8     1201/1155
  6        83.3     0      26.9     1247/1301
  7       116.9     0      37.8     1103/1116
  8       109.4     0      35.8     1143/1215
  9        95.3     0      30.9     1228/1245
 10        82.3     0      26.7     1304/1321
```

```
RUN#  79   SPANNING FROM  3/26/1974TO  3/29/1974

ST.#       DEP      C       NET       TIME
                          SODIUM    START/END

  3        55.6     0      54.0     1039/1125
  4        93.0     0      90.2     1103/1143
  7        66.5     0      64.6     1118/1204
```

```
RUN#  80   SPANNING FROM  3/26/1974TO  3/30/1974

ST.#       DEP      C       NET        TIME
                           SODIUM    START/END

  5     1840.0      7   2371.0      1157/1230
  9       70.0      0     90.2      1217/1248



RUN#  81   SPANNING FROM  3/26/1974TO  4/ 3/1974

ST.#       DEP      C       NET        TIME
                           SODIUM    START/END

  9       66.6      2    173.9      1247/1237
 10       87.6      3    223.0      1325/1211
```

```
RUN#  82   SPANNING FROM  3/29/1974TO  3/30/1974

ST.#       DEP      C       NET      TIME
                            SODIUM   START/END


  3        44.4     0       13.6     1127/1020
  4       134.7     0       43.4     1146/1155
  7        63.0     0       20.2     1206/1208




RUN#  83   SPANNING FROM  3/30/1974TO  4/ 3/1974

ST.#       DEP      C       NET      TIME
                            SODIUM   START/END


  3       119.4     0      152.3     1022/1000
  4       137.2     0      172.5     1157/1012
  5        77.7     0       98.0     1232/1105
  7        61.4     0       77.2     1210/1024
  8        65.5     0       82.1     1251/1047
```

```
RUN#  84   SPANNING FROM  4/ 3/1974TO  4/ 8/1974

ST.#      DEP      C       NET       TIME
                         SODIUM   START/END


  3      243.9     1      306.4    1003/ 926
  4      300.6     1      479.0    1014/ 940
  5      246.4     1      391.8    1107/1017
  6      311.7     1      494.5    1225/1119
  7      220.9     1      351.8    1027/ 950
  8      224.8     1      359.0    1050/1032
  9      247.7     1      391.5    1239/1106
 10      177.1     1      281.9    1214/1130
```

```
RUN#  85   SPANNING FROM  4/ 8/1974TO  4/ 9/1974

ST.#      DEP      C       NET       TIME
                         SODIUM   START/END


  3       61.6     0       21.0     930/1107
  4       86.6     0       29.6     942/1117
  5       95.2     0       32.1    1020/1138
  6      273.4     6       93.9    1121/1305
  7       75.5     0       25.6     952/1127
  8       44.1     0       14.9    1034/1150
  9       95.7     0       32.8    1108/1249
 10      138.1     0       47.5    1132/1319
```

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```
RUN#  86   SPANNING FROM  4/ 9/1974TO  4/11/1974

ST.#       DEP       C       NET        TIME
                            SODIUM    START/END


  3       163.0      0      106.2     1109/1200
  4       240.3      0      156.7     1119/1212
  5       156.4      0      102.9     1140/1258
  6       184.9      0      120.3     1307/1354
  7       160.4      0      104.6     1129/1223
  8       204.2      0      134.4     1151/1310
  9       126.0      0       82.7     1251/1405
 10       114.2      0       73.7     1322/1343
```

```
RUN#  87   SPANNING FROM  4/11/1974TO  4/16/1974

ST.#       DEP       C       NET        TIME
                            SODIUM    START/END


  3       208.4      0      331.0     1202/1136
  4       400.5      0      637.6     1214/1134
  5       263.1      0      418.4     1300/1211
  7       331.8      0      528.4     1225/1146
  8       387.5      0      617.3     1312/1235
```

```
RUN#  88   SPANNING FROM  4/11/1974TO  4/17/1974

ST.#      DEP      C       NET        TIME
                         SODIUM    START/END


  6       597.5    6    1147.0     1356/1349
  9       260.1    1     497.7     1407/1332
 10       556.4    1    1071.3     1345/1404




RUN#  89   SPANNING FROM  4/16/1974TO  4/17/1974

ST.#      DEP      C       NET        TIME
                         SODIUM    START/END


  3      1134.3    1     368.5     1106/1129
  4       892.0    1     293.0     1136/1213
  5       863.1    1     260.6     1213/1235
  7       948.2    1     311.0     1149/1224
  8       406.8    1     131.9     1237/1255
```

```
RUN#  90   SPANNING FROM  4/17/1974TO  4/18/1974

ST.#       DEP      C       NET       TIME
                           SODIUM   START/END


  3       230.7     1      76.2     1131/1216
  4      2134.9     1     690.8     1215/1230
  5       188.5     1      62.0     1237/1315
  6       255.3     1      83.6     1352/1424
  7       198.3     1      64.1     1226/1240
  8       134.2     1      44.0     1258/1332
  9       172.0     1      56.6     1334/1414
 10       229.5     1      74.8     1406/1432
```

```
RUN#  91   SPANNING FROM  4/18/1974TO  4/19/1974

ST.#       DEP      C       NET       TIME
                           SODIUM   START/END


  3       101.8     0      30.8     1220/1103
  4       146.3     0      45.2     1232/1140
  5        92.1     0      28.5     1317/1228
  6       125.5     0      38.2     1426/1315
  7       123.6     0      38.0     1242/1146
  8       116.9     0      36.0     1335/1241
  9        76.9     0      23.4     1417/1304
 10        62.7     0      19.1     1434/1325
 11       103.4     0      32.0     1308/1218
```

```
RUN#  92   SPANNING FROM  4/19/1974TO  4/20/1974

ST.#        DEP      C       NET       TIME
                            SODIUM   START/END


  3         99.7     0       33.4     1105/1212
  4        138.6     0       46.0     1146/1237
  5         93.0     0       30.6     1230/1312
  6         94.6     0       31.3     1317/1405
  7         90.3     0       30.0     1149/1245
  8        101.7     0       33.5     1243/1325
  9         65.6     0       22.0     1307/1415
 10         60.9     0       19.8     1328/1353
 11         83.5     0       27.6     1220/1304
```

```
RUN#  93   SPANNING FROM  4/20/1974TO  4/22/1974

ST.#        DEP      C       NET       TIME
                            SODIUM   START/END


  3        258.7     0      157.4     1215/ 951
  4        608.6     0      490.0     1239/1004
  5        530.8     0      322.0     1315/1043
  6        447.7     0      270.0     1406/1120
  7        411.3     0      249.4     1247/1014
  8        458.5     0      302.5     1323/1053
  9        209.5     0      126.4     1418/1132
 10        288.1     0      173.9     1357/1112
 11        666.4     0      367.6     1336/1032
```

```
RUN#  94   SPANNING FROM  4/22/1974TO  4/23/1974

ST.#       DEP      C       NET       TIME
                           SODIUM   START/END


  3       224.7     0      73.0      954/1015
  4       411.8     0     134.1     1007/1032
  5       310.4     0     101.0     1047/1111
  6       281.8     0      91.8     1126/1151
  7       361.7     0     117.8     1017/1041
  8       418.7     0     136.6     1056/1123
  9       226.8     0      74.2     1135/1206
 10       258.3     0      84.2     1115/1142
 11       316.4     0     103.1     1035/1101
```

```
RUN#  95   SPANNING FROM  4/23/1974TO  4/24/1974

ST.#       DEP      C       NET       TIME
                           SODIUM   START/END


  3       136.3     0      43.4     1019/1011
  4       178.9     0      57.1     1035/1030
  5        97.9     0      31.2     1114/1110
  6       404.0     0     145.0     1154/1448
  7       102.9     0      32.8     1045/1039
  8        98.4     0      31.4     1126/1121
  9        82.5     0      26.2     1209/1158
 10       206.7     0      65.9     1145/1140
 11        81.9     0      26.2     1104/1102
```

```
RUN#  96    SPANNING FROM  4/25/1974TO  4/26/1974

ST.#       DEP       C        NET        TIME
                            SODIUM    START/END


  4       354.6      0      112.6      1045/1032
  5       173.5      0       53.4      1137/1112
  6       287.0      0       89.8      1224/1151
  7       265.6      0       84.0      1059/1041
  8       247.5      0       77.6      1151/1123
  9       179.2      0       56.0      1236/1201
 10       193.4      0       60.6      1212/1141
 11       203.8      0       64.3      1125/1104
```

```
RUN#  97    SPANNING FROM  4/26/1974TO  4/26/1974

ST.#       DEP       C        NET        TIME
                            SODIUM    START/END


  3       252.5      0      161.8      1023/1025
  4       378.6      0      242.8      1035/1039
  5       182.0      0      116.2      1115/1106
  6       241.0      0      153.7      1155/1143
  7       247.0      0      158.4      1044/1048
  8       270.8      0      172.8      1126/1116
  9       211.4      0      134.7      1205/1151
 10       174.2      0      111.1      1147/1135
 11       316.4      0      202.0      1106/1057
```

```
RUN#  98   SPANNING FROM  4/28/1974TO  4/29/1974

ST.#       DEP      C       NET       TIME
                           SODIUM   START/END


  3       209.9     0       66.5     1029/1015
  4       249.1     0       79.0     1042/1028
  5       172.1     0       55.0     1108/1105
  6       160.1     0       51.0     1146/1140
  7       207.7     0       65.8     1051/1036
  8       236.3     0       75.4     1119/1114
  9       111.3     0       35.5     1154/1149
 10       127.2     0       40.6     1138/1133
 11       270.3     0       86.2     1102/1057
```

```
RUN#  99   SPANNING FROM  4/29/1974TO  4/30/1974

ST.#       DEP      C       NET       TIME
                           SODIUM   START/END


  3       160.0     0       51.7     1020/1033
  4       347.6     0      112.3     1031/1044
  5       105.8     0       34.1     1108/1118
  6       127.2     0       41.0     1143/1152
  7        73.5     0       23.8     1040/1053
  8        80.8     0       26.0     1118/1128
  9        62.9     0       20.3     1151/1202
 10        47.8     0       15.4     1136/1145
 11       205.8     0       66.4     1100/1111
```

```
RUN# 100   SPANNING FROM  4/30/1974TO  5/ 1/1974

ST.#       DEP      C       NET       TIME
                           SODIUM    START/END


  3       366.3     0      115.0     1036/1008
  4       613.6     0      192.6     1047/1018
  5       163.2     0       51.4     1121/1057
  6       368.0     0      116.2     1155/1135
  7        26.1     0        8.2     1056/1028
  8        29.8     0        9.4     1131/1108
  9        27.7     0        8.7     1205/1144
 10       218.9     0       68.7     1148/1126
 11       305.7     0       96.2     1114/1049
```

```
RUN# 101   SPANNING FROM  5/ 1/1974TO  5/ 2/1974

ST.#       DEP      C       NET       TIME
                           SODIUM    START/END


  3       479.0     0      154.6     1011/1020
  4       203.4     0       65.4     1022/1028
  5        41.5     0       13.4     1100/1113
  6       185.6     0       60.0     1138/1152
  7        95.5     0       30.7     1031/1037
  8        46.3     0       14.9     1111/1123
  9        21.6     0        7.0     1146/1201
 10        52.6     0       17.0     1130/1144
 11        86.5     0       28.0     1051/1106
```

```
RUN# 102   SPANNING FROM  5/ 2/1974TO  5/ 3/1974

ST.#       DEP      C       NET        TIME
                           SODIUM    START/END


  3       460.6     0     148.6      1023/1034
  4        81.5     0      26.5      1031/1053
  5        27.3     0       8.7      1116/1118
  6        52.5     0      17.0      1155/1210
  7        89.3     0      29.0      1040/1101
  8        25.6     0       8.2      1125/1128
  9        10.5     0       3.4      1204/1220
 10        77.3     0      25.0      1146/1200
 11        63.3     0      20.3      1109/1111
```

```
RUN# 103   SPANNING FROM  5/ 3/1974TO  5/ 4/1974

ST.#       DEP      C       NET        TIME
                           SODIUM    START/END


  3       321.1     0      91.6      1037/ 800
  4        23.0     0       6.5      1056/ 817
  5        28.3     0       8.2      1121/ 905
  6        17.3     0       5.0      1213/ 953
  7        16.1     0       4.6      1103/ 828
  8         9.3     0       2.7      1131/ 920
  9        28.3     0       8.2      1223/1005
 10         5.6     0       1.6      1209/ 943
 11         0.9     0       0.2      1113/ 851
```

```
RUN# 104   SPANNING FROM  5/ 4/1974TO  5/ 6/1974

ST.#        DEP      C       NET       TIME
                           SODIUM   START/END


  3        33.9      0      22.6      803/1007
  4        46.8      0      31.2      821/1019
  5        39.3      0      26.2      909/1105
  6       236.8      4     158.3      957/1203
  7        32.2      0      21.4      831/1031
  8        27.0      0      18.0      924/1120
  9        25.4      0      16.8     1006/1150
 10        62.7      0      42.2      947/1215
 11        29.0      0      19.3      855/1051
```

```
RUN# 105   SPANNING FROM  5/ 6/1974TO  5/ 7/1974

ST.#        DEP      C       NET       TIME
                           SODIUM   STA-T/END


  4        14.9      0       4.6     1021/ 925
  5        31.7      0       9.7     1106/1001
  6        60.1      0      18.1     1205/1040
  7         2.4      0       0.7     1034/ 935
  8        16.4      0       5.0     1122/1012
  9        38.4      0      11.8     1152/1055
 10       472.6      0     140.2     1217/1031
 11        21.2      0       6.5     1054/ 953
```

```
RUN# 106   SPANNING FROM  5/ 7/1974TO  5/ 8/1974

ST.#       DEP      C      NET       TIME
                          SODIUM   START/END


  3       407.3     1     130.8      916/ 920
  4       553.9     1     177.5      928/ 929
  5       218.0     1      69.8     1004/1004
  6       976.8     1     313.0     1043/1044
  7       310.5     1      99.5      938/ 939
  8       797.6     1     255.4     1015/1015
  9       474.1     1     149.5     1057/1035
 10       208.2     1      67.5     1033/1051
 11       325.6     1     104.2      956/ 955
```

```
RUN# 107   SPANNING FROM  5/ 9/1974TO  5/10/1974

ST.#       DEP      C      NET       TIME
                          SODIUM   START/END


  3         8.3     0       2.6      959/ 933
  4        97.7     0      30.7     1008/ 941
  5         7.5     0       2.3     1041/1015
  6        19.0     0       6.0     1121/1101
  7        15.6     0       4.9     1016/ 948
  8        10.8     0       3.4     1051/1027
  9         6.0     0       1.9     1113/1052
 10         7.4     0       2.3     1129/1112
 11       739.8     0     232.6     1033/1007
```

```
RUN# 108   SPANNING FROM  5/10/1974TO  5/11/1974

ST.#       DEP     C       NET       TIME
                          SODIUM   START/END


  3        40.3    0       12.2       936/ 824
  5        42.1    0       13.0      1017/ 927
  6        69.0    0       21.3      1105/1010
  7        46.3    0       14.2       951/ 849
  8        58.3    0       18.0      1030/ 939
  9        28.8    0        9.0      1055/1022
 10        52.7    0       16.0      1114/ 959
 11       284.6    0       87.4      1010/ 911
```

```
RUN# 109   SPANNING FROM  5/11/1974TO  5/13/1974

ST.#       DEP     C       NET       TIME
                          SODIUM   START/END


  3       107.2    0       72.0       827/1050
  4        71.3    0       47.9       839/1100
  5       111.7    0       75.4       930/1206
  6        90.6    0       61.0      1013/1242
  7        98.0    0       65.8       853/1112
  8       104.2    0       69.7       942/1151
  9        95.4    0       65.8      1024/1230
 10        88.3    0       59.9      1002/1253
 11       169.2    0      113.8       914/1138
```

```
RUN# 110   SPANNING FROM  5/13/1974TO  5/14/1974

ST.#      DEP      C      NET        TIME
                          SODIUM   START/END

  3       41.4     0      12.2     1052/ 903
  4      550.7     0     163.0     1102/ 913
  5      109.2     0      31.7     1208/ 955
  6       65.5     0      19.1     1244/1038
  7       54.2     0      16.0     1115/ 922
  8       56.8     0      16.8     1153/1006
  9       29.9     0       8.7     1232/1028
 10       41.5     0      12.1     1255/1046
 11      381.3     0     112.6     1140/ 948
```

```
RUN# 111   SPANNING FROM  5/14/1974TO  5/15/1974

ST.#      DEP      C      NET        TIME
 .                        SODIUM   START/END

  3       62.9     0      21.4      906/1035
  4      393.2     0     134.2      916/1051
  5       63.3     0      22.6      958/1244
  7      100.3     0      35.0      925/1135
  8       47.9     0      16.8     1009/1230
 11      272.0     0      95.8      951/1215
```

```
RUN# 112   SPANNING FROM  5/20/1974TO  5/21/1974

ST.#       DEP       C       NET       TIME
                            SODIUM   START/END


  3       130.4      0       41.4      844/ 833
  4       411.0      0      130.7      857/ 847
  5       185.9      0       58.5      945/ 920
  6       189.1      0       59.3     1035/1004
  7       256.4      0       81.5      909/ 858
  8       490.9      0      154.3     1000/ 933
  9       151.6      0       47.5     1047/1016
 10       158.7      0       49.1     1022/ 932
 11       258.8      0       81.5      935/ 911
```

```
RUN# 113   SPANNING FROM  5/21/1974TO  5/22/1974

ST.#       DEP       C       NET       TIME
                            SODIUM   START/END


  3       566.0      2      182.2      836/ 844
  4      1760.9      2      568.2      849/ 900
  5       591.8      2      192.3      923/ 944
  6       923.1      2      299.3     1007/1025
  7       792.8      2      255.6      901/ 911
  8       768.9      2      249.6      935/ 956
  9      1067.6      2      346.1     1019/1037
 10       772.0      2      254.1      935/1015
 11       988.1      2      320.8      915/ 933
```

```
RUN# 114   SPANNING FROM  5/22/1974TO  5/23/1974

ST.#        DEP      C       NET        TIME
                           SODIUM    START/END


  3         29.2     0        9.3      847/ 837
  4        135.4     0       43.0      902/ 850
  5        160.3     0       51.1      946/ 940
  6         60.6     0       19.4     1028/1028
  7         53.8     0       17.1      913/ 902
  8         58.8     0       18.8      958/ 952
  9         46.0     0       14.8     1037/1016
 10        126.3     0       41.0     1018/1038
 11        109.9     0       34.9      935/ 923



RUN# 115   SPANNING FROM  5/23/1974TO  5/24/1974

ST.#        DEP      C       NET        TIME
                           SODIUM    START/END


  3         25.9     0        8.9      839/1025
  4         35.8     0       12.3      852/1035
  5         36.3     0       12.3      943/1105
  6         25.3     0        8.5     1030/1147
  7         35.8     0       12.3      904/1045
  8         21.0     0        7.1      955/1118
  9         30.1     0       10.3     1018/1155
 10         35.4     0       11.8     1040/1137
 11         53.9     0       18.3      925/1054
```

```
RUN# 116   SPANNING FROM  5/24/1974TO  5/27/1974

ST.#        DEP       C        NET       TIME
                              SODIUM   START/END


  3        61.0       0        57.0     1027/ 830
  4        36.9       1        34.5     1038/ 843
  5       135.4       7       127.0     1107/ 925
  6        25.6       0        24.0     1149/1013
  7        52.0       0        48.6     1047/ 848
  8        77.6       0        72.8     1120/ 939
  9        45.0       0        42.0     1158/1003
 10        18.3       0        17.3     1139/1025
 11        30.6       0        28.7     1056/ 914
```

```
RUN# 117   SPANNING FROM  5/27/1974TO  5/28/1974

ST.#        DEP       C        NET       TIME
                              SODIUM   START/END


  3       245.3       0        78.6      832/ 833
  4        11.9       0         3.8      845/ 846
  5        36.0       0        11.5      926/ 925
  7        18.7       0         6.0      851/ 855
  8        30.0       0         9.5      942/ 935
  9        10.0       0         3.2     1005/1025
 10        29.5       0         9.3     1027/1003
 11        11.4       0         3.6      916/ 913
```

```
RUN# 118   SPANNING FROM  5/28/1974TO  5/29/1974

ST.#       DEP      C       NET       TIME
                           SODIUM   START/END


  3       660.4     2     210.6       836/ 830
  4       171.9     2      55.0       848/ 847
  5       150.2     2      48.2       927/ 930
  6       201.2     2      64.3      1017/1014
  7       175.5     2      56.2       858/ 858
  8       464.4     2     149.0       938/ 941
  9       180.8     2      57.7      1028/1024
 10       186.1     2      59.5      1006/1004
 11       349.3     2     112.1       916/ 920



RUN# 119   SPANNING FROM  5/29/1974TO  5/30/1974

ST.#       DEP      C       NET       TIME
                           SODIUM   START/END


  3        36.3     0      11.5       832/ 820
  4        98.8     0      31.3       850/ 834
  5        64.7     0      20.5       932/ 918
  6        20.3     0       6.4      1016/1000
  7         3.7     0       1.2       901/ 846
  8         4.7     0       1.5       944/ 930
  9         9.5     0       3.0      1026/1010
 10         6.3     0       2.0      1006/ 950
 11        57.2     0      18.1       923/ 907
```

```
RUN# 121   SPANNING FROM  5/30/1974TO  5/31/1974

ST.#       DEP       C       NET       TIME
                           SODIUM    START/END


  3       191.2      0       61.3      823/ 825
  4       114.3      0       36.6      835/ 843
  5       143.1      0       46.0      921/ 925
  6        68.5      0       22.0     1002/1007
  7        62.1      0       20.0      848/ 854
  8        25.3      0        8.1      933/ 937
  9        15.5      0        5.0     1013/1018
 10        21.0      0        6.6      952/ 958
 11        31.5      0       10.1      910/ 913
```

```
RUN# 121   SPANNING FROM  5/31/1974TO  6/ 3/1974

ST.#       DEP       C       NET       TIME
                           SODIUM    START/END


  3        45.8      0       44.0      828/ 827
  4       163.2      0      156.5      845/ 838
  5        49.2      0       47.2      928/ 924
  6        46.2      0       44.3     1010/1005
  7       120.7      0      115.7      856/ 849
  8        48.0      0       46.0      940/ 934
  9        62.1      0       59.6     1021/1017
 10       148.3      0      142.2     1000/ 955
 11        73.9      0       70.9      910/ 912
```

```
RUN# 122   SPANNING FROM  6/ 3/1974TO  6/ 4/1974

ST.#       DEP      C      NET      TIME
                          SODIUM   START/END

  3       229.2     1      73.3      830/ 828
  4       364.9     1     117.5      841/ 849
  5       422.2     1     135.0      927/ 925
  6       204.1     1      65.4     1003/1004
  7       317.6     1      97.6      952/ 854
  8        85.6     1      27.4      937/ 936
  9       151.3     1      48.2     1020/1013
 10       234.6     1      74.9      958/ 955
 11       194.2     1      62.2      915/ 915
```

```
RUN# 123   SPANNING FROM  6/ 4/1974TO  6/ 5/1974

ST.#       DEP      C      NET      TIME
                          SODIUM   START/END

  3       269.0     1      95.0      831/ 812
  4       159.0     1      50.2      846/ 826
  5       152.0     1      47.7      927/ 858
  6       285.5     1      89.5     1007/ 937
  7       107.0     1      33.8      857/ 835
  8       129.4     1      40.6      939/ 910
  9       166.0     1      52.0     1016/ 945
 10       198.2     1      62.2      957/ 928
 11       139.1     1      43.6      917/ 847
```

```
RUN# 124   SPANNING FROM  6/ 5/1974TO  6/ 6/1974

ST.#        DEP       C        NET        TIME
                              SODIUM    START/END


  3        175.8      1        57.0      815/ 833
  4        171.1      1        55.4      828/ 845
  5        142.2      1        46.0      900/ 915
  6        201.4      1        65.3      939/ 957
  7        141.1      1        45.7      837/ 855
  8        217.1      1        70.2      912/ 926
  9        197.9      1        64.3      948/1009
 10        185.6      1        60.1      931/ 947
 11        226.7      1        73.4      850/ 906
```

```
RUN# 125   SPANNING FROM  6/ 6/1974TO  6/ 7/1974

ST.#        DEP       C        NET        TIME
                              SODIUM    START/END


  3         29.2      0         9.3      836/ 827
  4         82.9      0        26.3      847/ 836
  5         81.8      0        26.0      917/ 907
  6        173.2      0        55.0      959/ 947
  7         60.3      0        19.1      857/ 845
  8        250.0      0        79.5      928/ 918
  9        380.0      0       120.4     1011/ 956
 10         47.2      0        15.0      949/ 938
 11         56.9      0        18.1      908/ 858
```

```
RUN# 126   SPANNING FROM  6/ 7/1974TO  6/ 8/1974

ST.#      DEP      C      NET       TIME
                         SODIUM   START/END

  5       44.9     0      14.5     909/ 926
  6      112.2     0      36.2     950/1003
 10       56.1     0      18.1     941/ 953
 11       69.5     0      22.5     901/ 917


RUN# 127   SPANNING FROM  6/ 8/1974TO  6/10/1974

ST.#      DEP      C      NET       TIME
                         SODIUM   START/END

  3       92.8     0      33.8     835/ 837
  4      296.0     0     164.0     850/ 851
  5       74.8     0      47.8     928/ 922
  6       67.7     0      43.4    1006/1011
  7      103.6     0      66.4     859/ 900
  8       99.1     0      63.4     940/ 938
  9       97.7     0      37.0    1018/1020
 10       73.6     0      47.2     956/1002
 11      133.5     0      85.3     920/ 913
```

```
RUN# 128   SPANNING FROM  6/11/1974TO  6/12/1974

ST.#      DEP      C       NET        TIME
                          SODIUM    START/END


  3       69.2     0       22.9       840/ 935
  4      208.3     0       66.2       900/ 849
  5      120.3     0       38.7       933/ 934
  6       74.2     0       23.8      1015/1014
  7      163.5     0       52.0       910/ 900
  8       73.1     0       23.3       944/ 940
  9       62.5     0       20.0      1026/1024
 10       88.0     0       28.1      1004/1003
 11      165.5     0       53.1       923/ 926
```

```
RUN# 129   SPANNING FROM  6/13/1974TO  6/14/1974

ST.#      DEP      C       NET        TIME
                          SODIUM    START/END


  3       23.5     0        7.5       914/ 908
  4      706.7     0      225.7       926/ 922
  5      118.7     0       37.6      1006/ 952
  7        8.0     0        2.6       936/ 934
  8        4.5     0        1.4      1019/1003
 11      288.3     0       91.9       953/ 944
```

```
RUN# 130   SPANNING FROM  6/18/1974TO  6/19/1974

ST.#       DEP      C       NET       TIME
                           SODIUM   START/END


  3        66.5     0       21.4      803/ 811
  4        99.3     0       31.7      826/ 822
  5        43.7     0       14.0      847/ 845
  6      1529.9     0      486.8      924/ 915
  7        39.4     0       12.6      832/ 829
  8        37.6     0       12.0      855/ 852
  9        16.0     0        5.1      932/ 923
 10        85.7     0       27.4      912/ 909
 11        34.1     0       10.9      841/ 837



RUN# 131   SPANNING FROM  6/19/1974TO  6/20/1974

ST.#       DEP      C       NET       TIME
                           SODIUM   START/END


  3        25.6     0        8.2      813/ 806
  4       133.0     0       42.4      824/ 819
  5        28.2     0        9.1      847/ 850
  6        44.7     0       14.4      917/ 923
  7        19.4     0        6.2      831/ 830
  8        27.2     0        8.8      854/ 859
  9         1.9     0        0.6      925/ 931
 10        16.5     0        5.3      911/ 915
 11        34.5     0       11.0      840/ 841
```

```
RUN# 132   SPANNING FROM  6/20/1974TO  6/21/1974

ST.#       DEP      C       NET       TIME
                          SODIUM   START/END


  3        92.3     0       31.8     808/ 958
  4       138.3     0       47.5     822/1007
  5       139.6     0       47.8     852/1032
  6       242.3     0       83.0     926/1107
  7       134.2     0       46.0     834/1015
  8       206.2     1       70.6     902/1042
  9       302.0     1      103.5     933/1115
 10        86.2     0       29.6     917/1100
 11       190.9     0       65.4     844/1025
```

```
RUN# 133   SPANNING FROM  6/21/1974TO  6/22/1974

ST.#       DEP      C       NET       TIME
                          SODIUM   START/END


  3        14.6     0        4.3    1000/ 804
  4        23.3     0        6.9    1009/ 820
  5        18.0     0        5.4    1035/ 902
  6        13.2     0        4.0    1110/ 948
  7        12.4     0        3.7    1017/ 832
  8         8.7     0        2.6    1045/ 915
  9        12.4     0        3.8    1117/1000
 10         3.6     0        1.1    1102/ 938
 11         4.6     0        1.4    1027/ 851
```

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```
RUN# 134   SPANNING FROM  6/22/1974TO  6/25/1974

ST.#      DEP      C       NET       TIME
                          SODIUM   START/END


  3      303.6     1     293.9      806/ 840
  4      389.6     1     376.8      822/ 851
  5      166.8     1     160.4      905/ 911
  6      272.0     1     261.6      951/ 956
  7      316.5     1     305.9      834/ 900
  9      219.1     1     210.6     1002/1004
 10      196.6     1     189.0      940/ 945
 11      644.5     1     619.4      853/ 855
```

```
RUN# 135   SPANNING FROM  6/25/1974TO  6/26/1974

ST.#      DEP      C       NET       TIME
                          SODIUM   START/END


  3     1628.9     1     524.8      842/ 851
  4      663.5     1     213.4      854/ 900
  7      961.5     1     309.2      903/ 909
```

```
RUN# 136   SPANNING FROM  6/25/1974TO  6/27/1974

ST.#        DEF      C       NET        TIME
                            SODIUM    START/END


  5        704.4     1      449.1       914/ 901
  6        948.6     1      602.9       959/ 937
  8        702.6     1      447.6       926/ 911
  9        538.3     1      342.5      1007/ 945
 10       1044.1     1      664.5       948/ 930



RUN# 137   SPANNING FROM  6/26/1974TO  6/27/1974

ST.#        DEP      C       NET        TIME
                            SODIUM    START/END


  4        660.9     0      207.5       903/ 835
  7        548.6     0      233.8       912/ 845
```

```
RUN# 138   SPANNING FROM  6/26/1974TO  6/28/1974

ST.#      DEP      C      NET      TIME
                         SODIUM   START/END

  3      407.6     0     260.2      854/ 845



RUN# 139   SPANNING FROM  6/27/1974TO  6/28/1974

ST.#      DEP      C      NET      TIME
                         SODIUM   START/END

  4       91.8     0      29.2      838/ 826
  5       91.1     0      29.2      903/ 906
  6       70.7     0      22.6      940/ 937
  7       97.6     0      31.0      847/ 835
  8       87.6     0      28.0      913/ 913
  9      163.2     0      52.1      947/ 943
 10       90.7     0      29.0      932/ 930
 11       85.1     0      27.2      857/ 857
```

```
RUN# 140   SPANNING FROM  6/28/1974TO  6/29/1974

ST.#       DEP      C      NET      TIME
                          SODIUM   START/END


  4        29.2     0       9.2     828/ 810
  5        34.4     0      11.0     909/ 900
  6        73.9     0      23.9     940/ 954
  7        99.1     0      31.5     838/ 829
  8        27.4     0       3.8     915/ 914
  9        47.0     0      15.3     946/1009
 10        54.8     0      17.6     932/ 939
 11        43.5     0      14.4     800/ 845
```

```
RUN# 141   SPANNING FROM  7/ 1/1974TO  7/ 2/1974

ST.#       DEP      C      NET      TIME
                          SODIUM   START/END


  3       367.0     1      99.9    1152/ 816
  4       628.0     1     179.9    1102/ 830
  5       442.5     1     123.3    1120/ 904
  6       375.0     1     107.0    1215/ 938
  7       499.0     1     143.5    1110/ 843
  8       557.3     1     160.6    1136/ 912
  9       356.9     1     101.8    1224/ 947
 10       410.7     1     117.0    1207/ 928
 11       544.4     1     157.0    1120/ 857
```

```
RUN# 142   SPANNING FROM  7/ 2/1974TO  7/ 3/1974

ST.#       DEP       C       NET        TIME
                            SODIUM    START/END


  3       153.0      0       48.8       818/ 811
  4       331.2      0      105.2       834/ 822
  5       216.5      0       68.7       906/ 853
  6       240.3      0       76.4       941/ 931
  7       259.4      0       82.2       846/ 831
  8       289.0      0       91.9       914/ 904
  9       701.1      7      223.4       949/ 942
 10       221.3      0       70.5       930/ 922
 11       247.1      0       78.2       859/ 842
```

```
RUN# 143   SPANNING FROM  7/ 3/1974TO  7/ 6/1974

ST.#       DEP       C       NET        TIME
                            SODIUM    START/END


  3       516.7      1      501.0       813/ 853
  4       556.7      1      540.0       824/ 906
  5       300.6      1      292.5       855/ 950
  6       334.1      1      325.7       933/1038
  7       337.8      1      328.0       833/ 920
  8       366.5      1      356.9       906/1005
  9       367.2      1      357.7       944/1045
 10       279.0      1      271.9       924/1026
 11       419.6      1      407.6       846/ 934
```

```
RUN# 144   SPANNING FROM  7/ 6/1974TO  7/ 8/1974

ST.#       DEP      C       NET        TIME
                          SODIUM    START/END


  5        98.0     0       62.3      954/ 931
  6       121.5     0       76.9     1041/1012
  8       110.2     0       70.0     1007/ 944
  9        62.4     0       39.5     1056/1024
 10       109.9     0       69.8     1028/1003
 11       199.5     0      120.7      933/ 922
```

```
RUN# 145   SPANNING FROM  7/ 8/1974TO  7/ 9/1974

ST.#       DEP      C       NET        TIME
                          SODIUM    START/END


  3        50.6     0       15.9      846/ 817
  4       765.9     0      239.8      853/ 826
  5        88.4     0       28.6      834/ 849
  6        91.6     0       28.2     1015/ 922
  7        62.1     0       19.4      903/ 834
  8        57.4     0       17.8      946/ 900
  9        30.7     0        9.4     1026/ 926
 10        47.3     0       14.6     1005/ 915
 11       327.8     0      102.1      924/ 844
```

```
RUN# 146   SPANNING FROM  7/ 9/1974TO  7/10/1974

ST.#       DEP      C      NET       TIME
                           SODIUM    START/END


  3        72.8     0      23.3      819/ 815
  4       449.1     0     143.5      828/ 825
  5        77.9     0      25.0      852/ 853
  6        53.0     0      17.0      924/ 926
  7       124.4     0      39.8      836/ 837
  8        78.1     0      25.0      902/ 902
  9        48.3     0      15.5      930/ 934
 10        51.6     0      16.6      917/ 920
 11       145.7     0      46.7      846/ 847
```

```
RUN# 147   SPANNING FROM  7/10/1974TO  7/11/1974

ST.#       DEP      C      NET       TIME
                           SODIUM    START/END


  3       180.8     0      57.5      817/ 808
  4       448.6     0     143.0      827/ 820
  5        85.0     0      27.2      855/ 854
  6        47.2     0      15.2      928/ 931
  7        64.5     0      20.5      839/ 829
  8        62.0     0      19.9      905/ 905
  9        39.3     0      12.6      937/ 938
 10        51.8     0      16.6      922/ 922
 11       141.9     0      45.2      849/ 842
```

```
RUN# 148   SPANNING FROM  7/11/1974TO  7/12/1974

ST.#       DEP       C        NET        TIME
                            SODIUM    START/END

  3       915.9      1      293.5       811/ 812
  4       664.7      1      212.8       822/ 822
  5       371.5      1      113.2       857/ 848
  6       439.1      1      139.4       933/ 921
  7       332.7      1      106.3       831/ 828
  8       839.6      1      267.2       907/ 858
  9       359.8      1      114.2       941/ 928
 10       455.6      1      144.8       925/ 914
 11       445.2      1      142.0       845/ 840
```

```
RUN# 149   SPANNING FROM  7/12/1974TO  7/13/1974

ST.#       DEP       C        NET        TIME
                            SODIUM    START/END

  3       244.5      0       79.4       815/ 836
  4        22.1      0        7.2       824/ 853
  5        14.9      0        4.9       850/ 930
  6        14.4      0        4.6       923/ 919
  7         4.5      0        1.5       830/ 905
  8        22.2      0        7.3       900/ 943
  9        11.4      0        3.6       930/1031
 10        18.8      0        6.2       916/1005
 11        25.3      0        8.3       842/ 920
```

```
RUN# 150   SPANNING FROM  7/13/1974TO  7/15/1974

ST.#       DEP      C      NET        TIME
                          SODIUM    START/END

  3       202.2     1     133.0      842/1000
  4       179.1     1     117.7      856/1012
  5       161.0     1     105.7      932/1044
  7       168.1     1     110.4      908/1023
  8       169.7     1     111.3      946/1055
 11       136.3     1      89.5      922/1035
```

```
RUN# 151   SPANNING FROM  7/15/1974TO  7/16/1974

ST.#       DEP      C      NET        TIME
                          SODIUM    START/END

  3        48.7     0      14.1     1002/ 743
  4       199.8     0      59.7     1015/ 838
  5        27.4     0       8.2     1046/ 911
  7        71.9     0      21.5     1025/ 848
  8        41.0     0      12.3     1057/ 925
 11        54.3     0      16.2     1037/ 859
```

```
RUN# 152   SPANNING FROM  7/16/1974TO  7/16/1974

ST.#       CFP      C      NET       TIME
                          SODIUM   START/END


  3        57.5     0      37.2      745/ 812
  4        84.8     0      54.0      840/ 823
  5        59.4     0      32.0      914/ 846
  6        40.9     0      25.8     1004/ 919
  7        29.5     0      18.8      850/ 831
  8        27.5     0      17.4      927/ 856
  9        35.7     0      22.5     1016/ 927
 10        34.8     0      22.0      953/ 912
 11        34.6     0      22.0      932/ 840
```

```
RUN# 153   SPANNING FROM  7/18/1974TO  7/19/1974

ST.#       CFP      C      NET       TIME
                          SODIUM   START/END


  3        59.8     0      19.2      815/ 820
  4       208.6     0      67.1      826/ 832
  5        88.4     0      28.8      843/ 913
  6        69.4     0      22.5      923/ 941
  7        76.1     0      24.5      833/ 842
  8        85.9     0      27.9      856/ 921
  9        57.3     0      18.6      929/ 950
 10        90.9     0      29.6      914/ 936
 11       114.1     0      36.8      842/ 852
```

APPENDIX E

DRIFT EMISSION DATA FOR THE COOLING TOWER

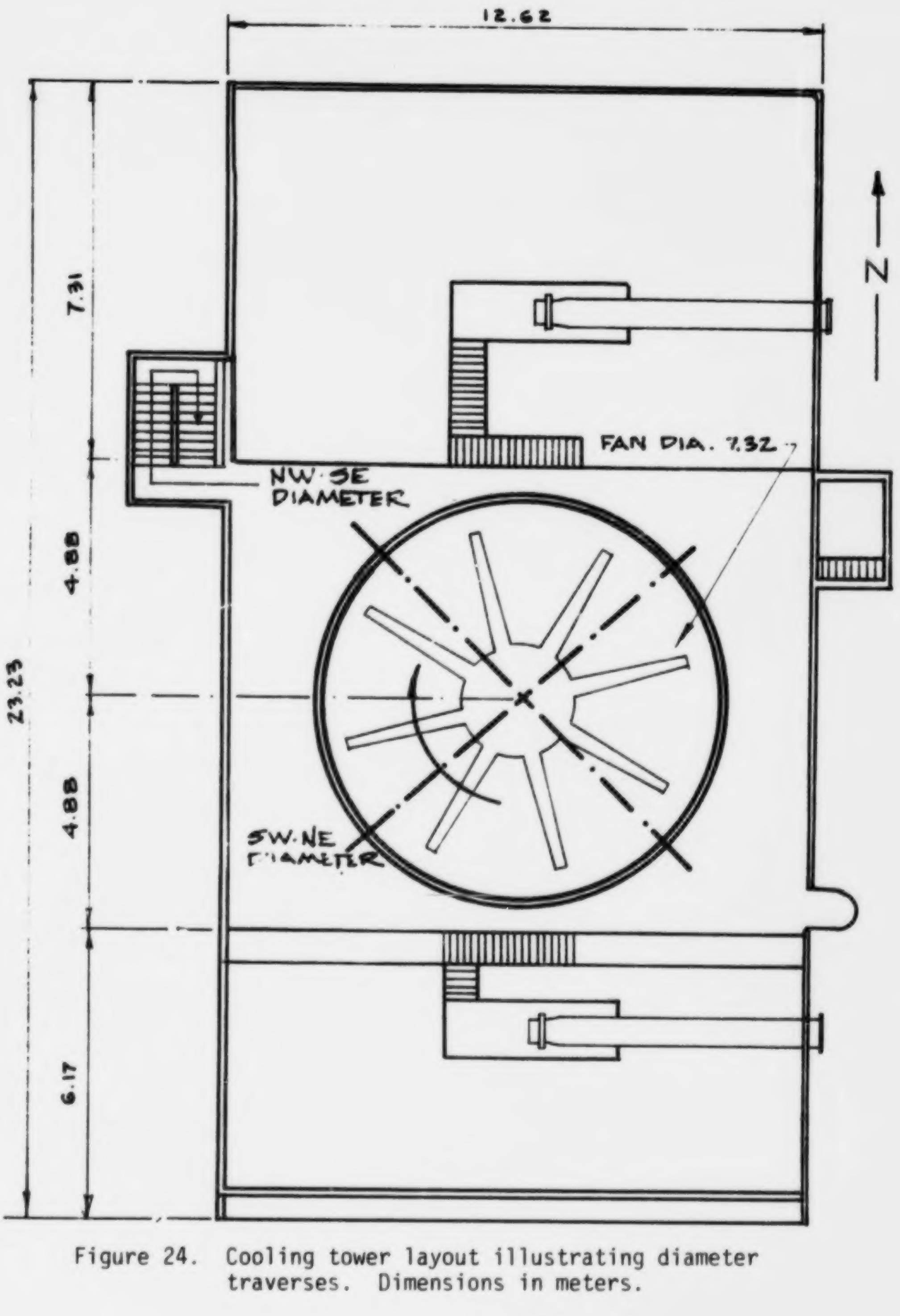

Figure 24. Cooling tower layout illustrating diameter traverses. Dimensions in meters.

FORMAT FOR DATA PRESENTATION - COOLING TOWER DRIFT EMISSION DATA

Note: For a more detailed description of the data format, see text Section VII "Data Format".

Table Headings

DIAMETER	Refers to the measurement traverse during which the data were taken. There were three traverses of the exit plane from SW to NE, hence all data sheets for this diameter will be labeled SW-NE 1, 2 or 3. Diameters SW-NE 1 and 2 were traversed during the winter test phase and diameter SW-NE 3 was done during the summer. Two traverses of the NW-SE diameter were made during the winter test, such that all data sheets for this diameter will be labeled NW-SE 1 or 2.
POSITION	Gives the location of the instrument package relative to the stack rim. Position 0 is located directly over the rim and succeeding positions are located at 1 foot (.3m) intervals along the diameter traverse.
DATE	Date on which the data were acquired.
TIME FRAME	Time interval for data acquisition period.

Column Headings

I	Integer number for droplet size ranges.
D(LOW)	The lower diameter of size range I, μm.
D(HI)	The upper diameter of size range I, μm.
DEL D	The width of the size range I, as determined by the difference between diameter D(HI) and D(LOW), μm.
D(CEN)	Center diameter of droplet size range I, μm.
P(D)	Particle density distribution; the number of droplets of diameter D within unit size range and unit volume of air, number/μm·m3.

DEL X/DEL D	Drift mass density distribution; the mass of droplets of diameter D within unit size range and unit volume of air, $\mu g/\mu m \cdot m^3$.
DEL X	Drift mass concentration; the drift mass due to droplets within a size range I per unit volume of air, $\mu g/m^3$.
DEL FLUX	Drift mass flux; the drift mass due to droplets within size range I which passes through a unit area per unit time, $\mu g/m^2 \cdot s$.
PARTICLE VEL	The vertical component of the droplet velocity of a droplet with diameter D(CEN) determined by the difference between the vertical component of the time mean air updraft velocity and the terminal velocity of a droplet of diameter D(CEN), m/s.
X	Drift mass concentration; mass of droplets of all size ranges per unit volume of air; sum of all DEL X, $\mu g/m^3$.
DRIFT FLUX	Total drift mass flux; mass flux of all droplets of all size ranges; sum of all DEL FLUX, $\mu g/m^2 \cdot s$.
DRIFT MASS EMIS	Total rate of drift mass emission for the given position, determined by the DRIFT FLUX multiplied by the half-annulus area, ΔA, associated with that position, $\mu g/s$.
MASS MEDIAN DIAM	The droplet diameter at which half of the emitted mass is due to smaller droplets and half due to larger droplets, μm.

Tower Conditions

$\overline{V}_u$	Time average updraft velocity of the cooling tower exiting air, m/s.
T_a	Temperature of the exiting air, °C.
T_i	Temperature of the hot water in the inlet basins, °C.
T_o	Temperature of the cold water at the discharge pipe, °C.

Range	The difference between the inlet and outlet water temperatures, $T_i - T_o$, °C.
Approach	The difference between the temperature of the water leaving the cooling tower and the wet bulb temperature of the air; $T_o - T_{wet}$, °C.
Heat Load	The rate at which heat is removed from the circulating water, megawatts.

Ambient Conditions

Wind Speed	Wind speed in km/hr.
Wind Direction	Direction from which wind is blowing.
T_{wet}/T_{dry}	Wet and dry bulb temperatures of the ambient air, °C.

Note: Tabular data are presented in E format which designates scientific notation. Example: 5E 01 = 5×10^1

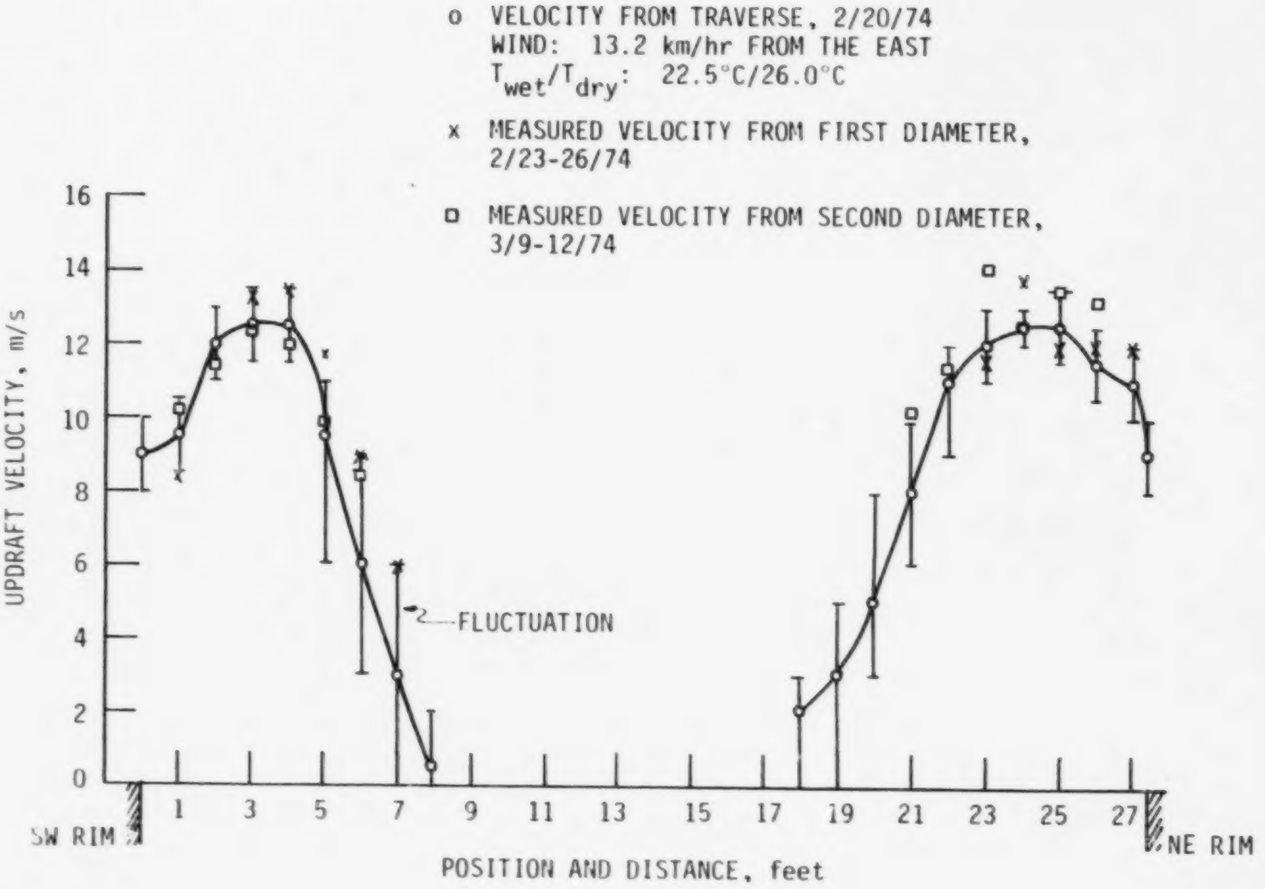

Figure 25. Velocity profile, SW-NE diameter.

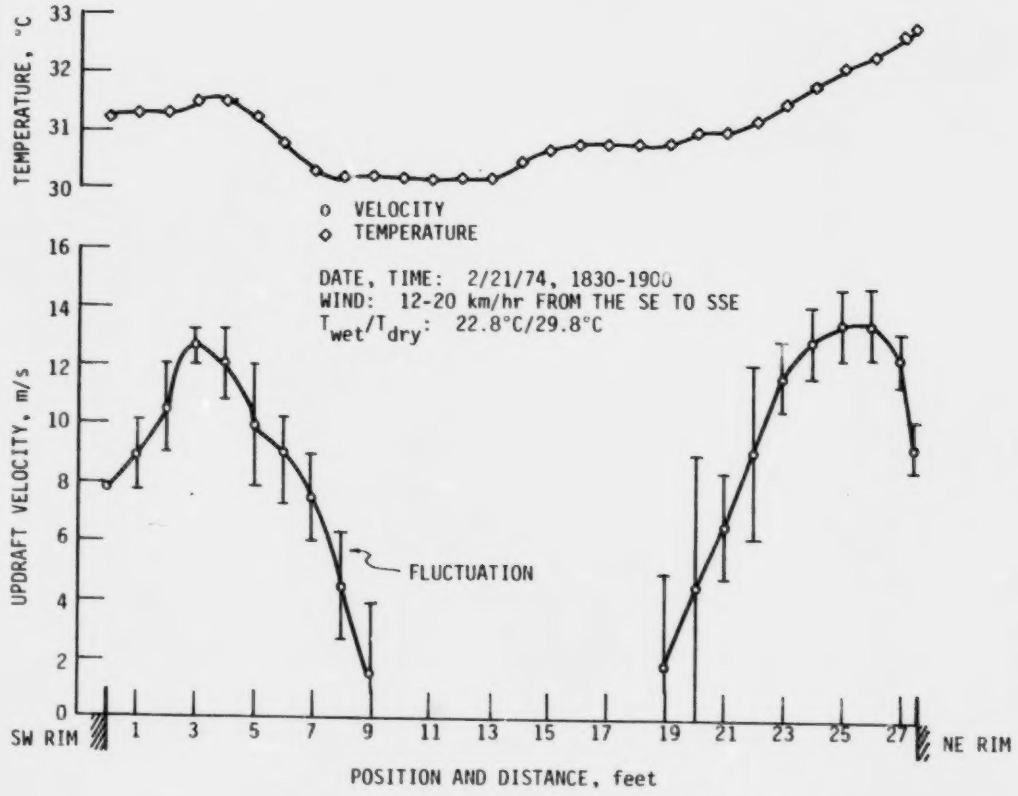

Figure 26. Velocity and temperature profiles, SW-NE diameter.

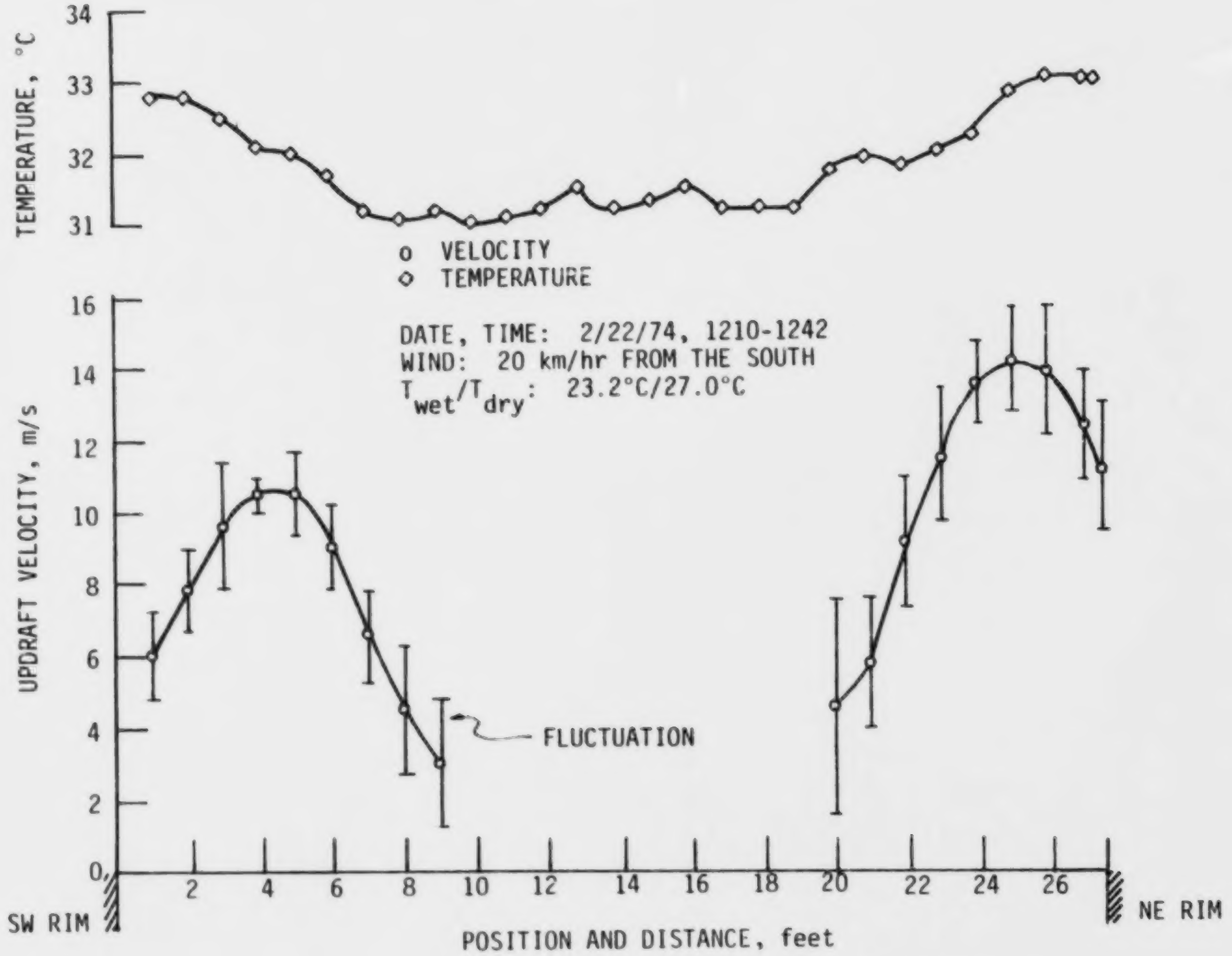

Figure 27. Velocity and temperature profiles, SW-NE diameter.

Table 6

PER CENT COUNTS IN EACH VELOCITY RANGE FOR EACH POSITION

SW-NE DIAMETER
MEASURED ON 3/8/74, 1400 - 1515

VELOCITY RANGE, m/s	0	1	2	3	4	5	6	7	8	9	10	11	12
16.10-17.05			.04	.08	.07								
15.14-16.10		.08	.38	.16	.20								
14.19-15.14		.10	1.68	1.89	1.57	.02							
13.24-14.19	.32	.26	8.96	7.20	7.90	.36	.02						
12.29-13.24	1.94	3.00	23.4	20.5	17.0	2.16	.22						
11.33-12.29	9.42	14.2	3.03	22.4	18.3	8.65	1.16						
10.38-11.33	26.3	37.7	23.1	17.1	20.4	16.9	4.51	.34					
9.43-10.38	29.3	29.3	8.46	10.4	14.3	15.1	9.65	1.88					
8.48- 9.43	23.3	12.9	2.40	8.23	8.76	13.3	13.1	3.47	.36				
7.52- 8.48	8.18	2.26	1.38	6.44	4.54	10.9	13.3	7.84	1.54				
6.57- 7.52	1.22	.28		3.80	2.84	9.23	14.1	10.9	4.11	.04	.18		
5.62- 6.57				.91	1.71	7.33	13.6	11.3	6.86	.52	.22		
4.67- 5.62				.40	.78	5.89	9.67	9.84	10.0	.84	.32		
3.71- 4.67				.36	1.01	4.35	8.40	12.6	10.9	3.05	1.02		
2.76- 3.71				.08	.60	3.85	5.85	15.2	12.5	5.99	.76	.68	
1.81- 2.76					.03	1.08	4.41	10.6	12.7	11.3	3.49	2.88	
.86- 1.81						.84	1.72	7.49	20.1	13.3	5.29	8.16	1.68
.06&below					.04	.04	.18	8.56	21.0	65.0	88.7	88.3	98.3

POSITION

NOTE: Pulse Height Analyzer did not accept negative voltages. Lowest velocity range includes, therefore, all negative updraft velocities.

											.80			
										.16	3.84			
										5.07	28.9	1.04		
										26.0	43.0	7.18		
									4.30	30.7	18.6	21.5	.26	.74
								1.70	21.1	18.0	4.54	26.7	6.56	1.78
							.20	7.08	28.9	7.92	.94	21.6	21.3	5.93
							2.42	16.3	19.5	4.43	.02	11.8	24.8	17.2
						.04	7.54	19.6	10.7	3.59		5.60	22.8	27.9
						1.20	13.7	18.1	7.68	2.31		2.56	17.1	25.4
					.44	3.21	20.4	14.8	3.42	1.10		1.30	5.30	13.9
				0.02	1.92	5.97	25.9	12.4	1.72	.59		.72	1.18	5.65
			.06	1.52	7.71	13.3	18.6	5.80	1.28	.16			.50	1.42
			2.06	9.50	18.9	27.9	7.33	2.92	.66				.24	
.30			9.92	25.5	28.7	24.4	2.65	.98	.32					
.84	1.30	2.84	35.0	35.8	27.9	19.3	1.23	.26	.44					
98.9	98.7	97.2	52.9	27.6	14.4	4.67		.04	.02					
13	14	15	16	17	18	19	20	21	22	23	24	25	26	27

Table 7

PER CENT COUNTS IN EACH VELOCITY RANGE FOR EACH POSITION

SW-NE DIAMETER
MEASURED ON 3/9/74, 1545-1650

Note: Refer to velocity profile of same day and time, Figure 28.

VELOCITY RANGE, m/s	0	1	2	3	4	5	6	7	8	9	10	11	12
18.00-18.95													
17.05-18.00			.06										
16.10-17.05			.12										
15.14-16.10			.12	.58	.30								
14.19-15.14			1.40	5.80	3.5	.22							
13.24-14.19		.08	5.34	20.1	12.7	1.98							
12.29-13.24		.86	14.5	24.7	18.6	7.24	.02						
11.33-12.29	1.78	9.15	29.6	29.9	28.4	15.6	.18						
10.38-11.33	13.0	26.9	26.6	12.2	17.4	18.9	.74						
9.43-10.38	23.4	24.4	10.9	3.48	8.24	13.0	1.70	.08					
8.48- 9.43	34.1	24.3	8.78	2.36	6.32	13.9	4.79	.40					
7.52- 8.48	15.5	9.78	1.76	.64	2.50	9.56	8.69	1.64					
6.57- 7.52	8.75	3.40	.51	.18	1.64	7.90	12.5	3.49	.04				
5.62- 6.57	3.14	1.04	.28	.02	.48	4.73	16.9	6.57	1.78				
4.67- 5.62	.26	.10			.04	3.19	15.4	10.2	2.83	.16			
3.71- 4.67	.06	.02				2.39	17.5	13.5	6.10	1.64		.08	
2.76- 3.71	.02					1.26	13.3	20.5	11.0	3.00		1.12	
1.81- 2.76						.01	7.01	19.9	17.8	7.97	.30	1.96	.02
.86- 1.81							1.42	15.6	21.8	14.3	.66	9.69	1.36
.86&below								8.00	38.7	72.9	99.0	87.2	98.6

NOTE: Pulse Height Analyzer did not accept negative voltages. Lowest velocity range includes, therefore, all negative updraft velocities.

											.14			
										.80	1.34			
									.26	5.12	8.05	.82	1.02	
								.06	2.23	16.1	20.8	5.36	0.0	
							.02	1.18	10.4	19.8	20.4	12.7	5.48	
							.24	12.2	29.6	31.5	31.4	33.9	25.1	
							1.24	21.0	26.6	14.9	10.1	22.1	26.9	
							3.78	16.9	12.5	5.52	4.17	10.7	15.2	
						.04	8.23	21.8	12.1	4.34	2.84	9.86	17.5	.14
						1.00	14.1	12.9	3.93	.88	.58	3.16	5.48	1.22
						3.64	14.7	7.80	1.71	.26	.08	1.16	2.42	3.08
					.46	7.89	18.9	4.38	.62	.28		.22	.78	7.53
					2.80	12.0	15.1	1.28	.06	.32		.02	.06	16.9
				.10	10.0	17.7	12.4	.38		.08				32.0
				2.97	17.8	21.6	7.97	.12		.06				29.1
.46		.14	1.10	5.77	21.8	18.0	2.84			.02				9.46
2.27	1.78	2.80	3.21	15.1	16.3	12.1	.48							.70
97.3	98.2	97.1	95.7	76.0	.31	5.10	.02							
13	14	15	16	17	18	19	20	21	22	23	24	25	26	27

POSITION

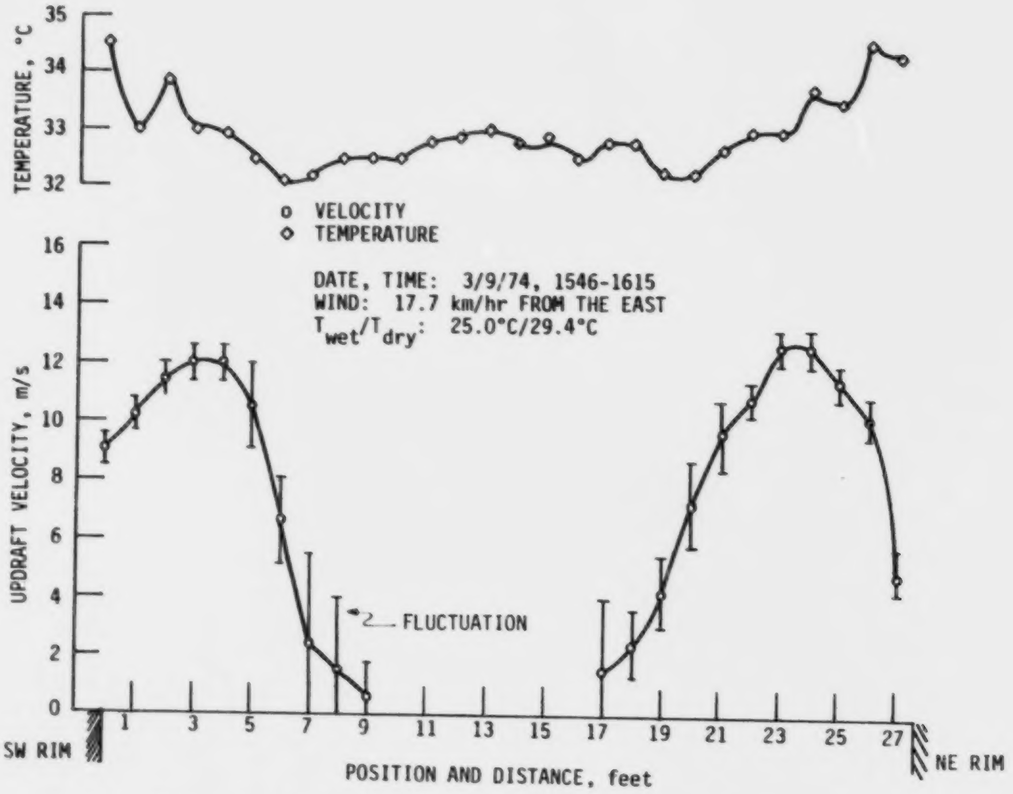

Figure 28. Velocity and temperature profiles, SW-NE diameter.
(see velocity distribution, Table 7.)

DIAMETER: SW-NE 1 POSITION: 1 DATE: 2/23/74 TIME FRAME: 1330-1430

NOTE: Concurrent IK Data Point: Position 0.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	7.900E 03	3.309E 01	6.618E 02	5.551E 03	8.388E 00
2	30.	50.	20.	40.	1.600E 03	5.352E 01	1.072E 03	8.956E 03	8.352E 00
3	50.	80.	30.	65.	2.500E 02	3.595E 01	1.078E 03	8.930E 03	8.280E 00
4	80.	110.	30.	95.	5.000E 01	2.245E 01	6.734E 02	5.497E 03	8.163E 00
5	110.	150.	40.	130.	6.300E 00	7.247E 00	2.899E 02	2.318E 03	7.998E 00
6	150.	200.	50.	175.	8.900E-01	2.497E 00	1.249E 02	9.692E 02	7.761E 00
7	200.	250.	50.	225.	2.000E-01	1.193E 00	5.964E 01	4.466E 02	7.488E 00
8	250.	300.	50.	275.	7.900E-02	8.602E-01	4.301E 01	3.104E 02	7.217E 00
9	300.	350.	50.	325.	3.500E-02	6.291E-01	3.145E 01	2.188E 02	6.956E 00
10	350.	400.	50.	375.	1.600E-02	4.418E-01	2.209E 01	1.482E 02	6.709E 00
11	400.	450.	50.	425.	7.100E-03	2.854E-01	1.427E 01	9.238E 01	6.474E 00
12	450.	500.	50.	475.	3.500E-03	1.964E-01	9.820E 00	6.141E 01	6.254E 00
13	500.	550.	50.	525.	2.000E-03	1.515E-01	7.577E 00	4.580E 01	6.045E 00
14	550.	600.	50.	575.	1.300E-03	1.294E-01	6.470E 00	3.784E 01	5.848E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
4.095E 03	3.358E 04	1.239E 05	59

TOWER CONDITIONS: $\overline{V}_u$ = 8.4 m/s ; T_a = 33.2°C ; T_1 = 35.9 °C ; T_o = 30.4 °C

Range: 5.5 °C ; Approach: 11.4 °C ; Heat Load: ~28.9 MW

AMBIENT CONDITIONS: Wind Speed: 7.5 Km/hr ; Wind Direction: NE ; Twet/Tdry = 19.0/22.5 °C

DIAMETER: SW-NE 1 **POSITION:** 2 **DATE:** 2/23/74 **TIME FRAME:** 1615-1758

NOTE: Concurrent IK Data Point: Position 1.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	7.100E 03	2.974E 01	5.948E 02	6.952E 03	1.169E 01
2	30.	50.	20.	40.	1.130E 03	3.787E 01	7.573E 02	8.824E 03	1.165E 01
3	50.	80.	30.	65.	1.400E 02	2.013E 01	6.039E 02	6.994E 03	1.158E 01
4	90.	110.	30.	95.	2.500E 01	1.122E 01	3.367E 02	3.859E 03	1.146E 01
5	110.	150.	40.	130.	7.900E 00	9.088E 00	3.635E 02	4.107E 03	1.130E 01
6	150.	200.	50.	175.	2.200E 00	6.174E 00	3.087E 02	3.414E 03	1.106E 01
7	200.	250.	50.	225.	5.000E-01	2.982E 00	1.491E 02	1.608E 03	1.079E 01
8	250.	300.	50.	275.	1.800E-01	1.960E 00	9.800E 01	1.031E 03	1.052E 01
9	300.	350.	50.	325.	8.900E-02	1.600E 00	7.999E 01	8.203E 02	1.026E 01
10	350.	400.	50.	375.	5.000E-02	1.381E 00	6.903E 01	6.909E 02	1.001E 01
11	400.	450.	50.	425.	3.500E-02	1.407E 00	7.034E 01	6.875E 02	9.774E 00
12	450.	500.	50.	475.	2.200E-02	1.235E 00	6.173E 01	5.897E 02	9.554E 00
13	500.	550.	50.	525.	1.400E-02	1.061E 00	5.304E 01	4.956E 02	9.345E 00
14	550.	600.	50.	575.	1.000E-02	9.954E-01	4.977E 01	4.553E 02	9.148E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
3.596E 03	4.053E 04	1.390E 05	72

TOWER CONDITIONS: $\overline{V}_u$ =11.7 m/s ; T_a = 33.5°C ; T_i = 35.9 °C ; T_o =30.6 °C

Range: 5.3 °C ; Approach: 10.5 °C ; Heat Load: ~27.9 MW

AMBIENT CONDITIONS: Wind Speed: 9.5 Km/hr ; Wind Direction: NE ; T_{wet}/T_{dry} = 20.1/23.5 °C

DIAMETER: SW-NE 1 **POSITION:** 3 **DATE:** 2/23/74 **TIME FRAME:** 1820-1920

NOTE: Concurrent IK Data Point: Position 2.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	8.900E 03	3.728E 01	7.456E 02	9.833E 03	1.319E 01
2	30.	50.	20.	40.	1.250E 03	4.189E 01	8.378E 02	1.102E 04	1.315E 01
3	50.	80.	30.	65.	1.400E 02	2.013E 01	6.039E 02	7.899E 03	1.308E 01
4	80.	110.	30.	95.	2.200E 01	9.876E 00	2.963E 02	3.841E 03	1.296E 01
5	110.	150.	40.	130.	1.000E 01	1.150E 01	4.601E 02	5.889E 03	1.280E 01
6	150.	200.	50.	175.	5.600E 00	1.571E 01	7.857E 02	9.870E 03	1.256E 01
7	200.	250.	50.	225.	3.500E 00	2.087E 01	1.044E 03	1.282E 04	1.229E 01
8	250.	300.	50.	275.	2.200E 00	2.396E 01	1.198E 03	1.439E 04	1.202E 01
9	300.	350.	50.	325.	1.400E 00	2.516E 01	1.258E 03	1.479E 04	1.176E 01
10	350.	400.	50.	375.	1.000E 00	2.761E 01	1.381E 03	1.589E 04	1.151E 01
11	400.	450.	50.	425.	7.100E-01	2.854E 01	1.427E 03	1.609E 04	1.127E 01
12	450.	500.	50.	475.	4.500E-01	2.525E 01	1.263E 03	1.396E 04	1.105E 01
13	500.	550.	50.	525.	3.200E-01	2.425E 01	1.212E 03	1.315E 04	1.085E 01
14	550.	600.	50.	575.	2.500E-01	2.489E 01	1.244E 03	1.325E 04	1.065E 01

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
1.376E 04	1.627E 05	5.108E 05	336

TOWER CONDITIONS: $\overline{V}_u$ = 13.2 m/s ; T_a = 33.5°C ; T_i = 36.0 °C ; T_o = 30.6 °C

Range: 5.4 °C ; Approach: 10.4 °C ; Heat Load: ~28.4 MW

AMBIENT CONDITIONS: Wind Speed: 10.1 Km/hr ; Wind Direction: NE ; Twet/Tdry = 20.2/22.6 °C

DIAMETER: SW-NE 1 POSITION: 4 DATE: 2/25/74 TIME FRAME: 1120-1220

NOTE: Concurrent IK Data Point: Position 3.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	7.900E 03	3.309E 01	6.618E 02	8.926E 03	1.349E 01
2	30.	50.	20.	40.	1.400E 03	4.691E 01	9.383E 02	1.262E 04	1.345E 01
3	50.	80.	30.	65.	1.800E 02	2.588E 01	7.765E 02	1.039E 04	1.338E 01
4	80.	110.	30.	95.	2.800F 01	1.257E 01	3.771E 02	5.001E 03	1.326E 01
5	110.	150.	40.	130.	5.600E 00	6.442E 00	2.577E 02	3.375E 03	1.310E 01
6	150.	200.	50.	175.	1.800E 00	5.051E 00	2.526E 02	3.248E 03	1.286E 01
7	200.	250.	50.	225.	5.600E-01	3.340E 00	1.670E 02	2.102E 03	1.259E 01
8	250.	300.	50.	275.	2.500E-01	2.722E 00	1.361E 02	1.677E 03	1.232E 01
9	300.	350.	50.	325.	1.600E-01	2.876E 00	1.438E 02	1.734E 03	1.206E 01
10	350.	400.	50.	375.	1.000E-01	2.761E 00	1.381E 02	1.630E 03	1.181E 01
11	400.	450.	50.	425.	6.300E-02	2.532E 00	1.266E 02	1.465E 03	1.157E 01
12	450.	500.	50.	475.	4.000E-02	2.245E 00	1.122E 02	1.274E 03	1.135E 01
13	500.	550.	50.	525.	2.800E-02	2.121E 00	1.061E 02	1.182E 03	1.115E 01
14	550.	600.	50.	575.	1.800E-02	1.792E 00	8.959E 01	9.808E 02	1.095E 01

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
4.283E 03	5.561E 04	1.579E 05	71

TOWER CONDITIONS: $\overline{V}_u$ = 13.5 m/s ; T_a = 31.7°C ; T_i = 34.0 °C ; T_o = 28.3 °C

Range: 5.7 °C ; Approach: 11.3 °C ; Heat Load: ~30.0 MW

AMBIENT CONDITIONS: Wind Speed: 18.4 Km/hr ; Wind Direction: N ; T_{wet}/T_{dry} = 17.0/21.0 °C

DIAMETER: SW-NE 1 **POSITION:** 5 **DATE:** 2/25/74 **TIME FRAME:** 1235-1335

NOTE: Concurrent IK Data Point: Position 4.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	6.300E 03	2.639E 01	5.278E 02	6.169E 03	1.169E 01
2	30.	50.	20.	40.	1.000E 03	3.351E 01	6.702E 02	7.809E 03	1.165E 01
3	50.	80.	30.	65.	1.000E 02	1.438E 01	4.314E 02	4.995E 03	1.158E 01
4	80.	110.	30.	95.	1.300E 01	5.836E 00	1.751E 02	2.007E 03	1.146E 01
5	110.	150.	40.	130.	2.800E 00	3.221E 00	1.288E 02	1.456E 03	1.130E 01
6	150.	200.	50.	175.	7.900E-01	2.217E 00	1.108E 02	1.226E 03	1.106E 01
7	200.	250.	50.	225.	3.500E-01	2.087E 00	1.044E 02	1.126E 03	1.079E 01
8	250.	300.	50.	275.	1.800E-01	1.960E 00	9.800E 01	1.031E 03	1.052E 01
9	300.	350.	50.	325.	1.000E-01	1.797E 00	8.987E 01	9.217E 02	1.026E 01
10	350.	400.	50.	375.	6.300E-02	1.740E 00	8.698E 01	8.705E 02	1.001E 01
11	400.	450.	50.	425.	3.500E-02	1.407E 00	7.034E 01	6.875E 02	9.774E 00
12	450.	500.	50.	475.	2.000E-02	1.122E 00	5.612E 01	5.361E 02	9.554E 00
13	500.	550.	50.	525.	1.100E-02	8.334E-01	4.167E 01	3.894E 02	9.345E 00
14	550.	600.	50.	575.	7.100E-03	7.067E-01	3.534E 01	3.233E 02	9.148E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
2.627E 03	2.955E 04	7.534E 04	58

TOWER CONDITIONS: $\overline{V}_u$ = 11.7 m/s ; T_a = 30.8 °C ; T_1 = 35.3 °C ; T_o = 29.2 °C

Range: 6.1 °C ; Approach: 12.1 °C ; Heat Load: ~32.1 MW

AMBIENT CONDITIONS: Wind Speed: 13.1 Km/hr ; Wind Direction: N ; T_{wet}/T_{dry} = 17.0/21.7 °C

DIAMETER: SW-NE 1 POSITION: 6 DATE: 2/25/74 TIME FRAME: 1406-1506

NOTE: Concurrent IK Data Point: Position 5.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	5.600E 03	2.346E 01	4.691E 02	4.216E 03	8.988E 00
2	30.	50.	20.	40.	8.900E 02	2.982E 01	5.965E 02	5.340E 03	8.952E 00
3	50.	80.	30.	65.	1.100E 02	1.582E 01	4.745E 02	4.214E 03	8.880E 00
4	80.	110.	30.	95.	1.100E 01	4.938E 00	1.481E 02	1.298E 03	8.763E 00
5	110.	150.	40.	130.	2.000E 00	2.301E 00	9.203E 01	7.912E 02	8.598E 00
6	150.	200.	50.	175.	5.000E-01	1.403E 00	7.015E 01	5.866E 02	8.361E 00
7	200.	250.	50.	225.	1.400E-01	8.350E-01	4.175E 01	3.376E 02	8.088E 00
8	250.	300.	50.	275.	5.000E-02	5.445E-01	2.722E 01	2.128E 02	7.817E 00
9	300.	350.	50.	325.	2.000E-02	3.595E-01	1.797E 01	1.358E 02	7.556E 00
10	350.	400.	50.	375.	9.000E-03	2.485E-01	1.243E 01	9.081E 01	7.309E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
1.950E 03	1.722E 04	3.823E 04	47

TOWER CONDITIONS: $\overline{V}_u$ = 9.0 m/s ; T_a =30.8 °C ; T_i = 35.6 °C ; T_o = 29.2 °C

Range: 6.4 °C ; Approach: 12.2 °C ; Heat Load: ~ 33.7 MW

AMBIENT CONDITIONS: Wind Speed: 17.1 Km/hr ; Wind Direction: N ; T_{wet}/T_{dry} = 16.9/22.0 °C

DIAMETER: SW-NE 1 POSITION: 7 DATE: 2/25/74 TIME FRAME: 1539-1600

NOTE: Concurrent IK Data Point: Position NA

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	5.000E 03	2.094E 01	4.189E 02	2.508E 03	5.988E 00
2	30.	50.	20.	40.	6.300E 02	2.111E 01	4.222E 02	2.513E 03	5.952E 00
3	50.	80.	30.	65.	8.900E 01	1.280E 01	3.839E 02	2.258E 03	5.880E 00
4	80.	110.	30.	95.	1.300E 01	5.836E 00	1.751E 02	1.009E 03	5.763E 00
5	110.	150.	40.	130.	2.500E 00	2.876E 00	1.150E 02	6.439E 02	5.598E 00
6	150.	200.	50.	175.	7.100E-01	1.992E 00	9.962E 01	5.341E 02	5.361E 00
7	200.	250.	50.	225.	2.000E-01	1.193E 00	5.964E 01	3.034E 02	5.088E 00
8	250.	300.	50.	275.	6.200E-02	6.751E-01	3.376E 01	1.626E 02	4.817E 00
9	300.	350.	50.	325.	1.600E-02	2.876E-01	1.438E 01	6.552E 01	4.556E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
1.723E 03	9.997E 03	1.999E 04	52

TOWER CONDITIONS: $\overline{V}_u$ = 6.0 m/s ; T_a = 30.8°C ; T_i = 35.3 °C ; T_o = 28.9 °C

Range: °C ; Approach: 13.1 °C ; Heat Load: ~33.8 MW

AMBIENT CONDITIONS: Wind Speed: 19.1 Km/hr ; Wind Direction: N ; Twet/Tdry = 14.0/18.0 °C

DIAMETER: SW-NE 1 **POSITION:** 20 **DATE:** 2/26/74 **TIME FRAME:** 1930-1930

NOTE: Concurrent IK Data Point: Position NA

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	6.300E 03	2.639E 01	5.278E 02	2.368E 03	4.488E 00
2	30.	50.	20.	40.	1.250E 03	4.189E 01	8.378E 02	3.730E 03	4.452E 00
3	50.	80.	30.	65.	2.820E 02	4.055E 01	1.216E 03	5.328E 03	4.380E 00
4	80.	110.	30.	95.	6.300E 01	2.828E 01	8.485E 02	3.617E 03	4.263E 00
5	110.	150.	40.	130.	1.600E 01	1.841E 01	7.362E 02	3.017E 03	4.098E 00
6	150.	200.	50.	175.	5.000E 00	1.403E 01	7.015E 02	2.709E 03	3.861E 00
7	200.	250.	50.	225.	1.600E 00	9.543E 00	4.771E 02	1.712E 03	3.588E 00
8	250.	300.	50.	275.	5.600E-01	6.098E 00	3.049E 02	1.011E 03	3.317E 00
9	300.	350.	50.	325.	2.500E-01	4.494E 00	2.247E 02	6.867E 02	3.056E 00
10	350.	400.	50.	375.	1.300E-01	3.590E 00	1.795E 02	5.041E 02	2.809E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAMETER (UM)
6.054E 03	2.468E 04	4.517E 04	96

TOWER CONDITIONS: $\overline{V}_u$ = 4.5 m/s ; T_a = 24.7 °C ; T_1 = 29.0 °C ; T_o = 23.3 °C

Range: 5.7 °C ; Approach: 17.2 °C ; Heat Load: ~30.0 MW

AMBIENT CONDITIONS: Wind Speed: 18.6 Km/hr ; Wind Direction: N ; T_{wet}/T_{dry} = 6.1/10.7 °C

DIAMETER: SW-NE 1 POSITION: 23 DATE: 2/26/74 TIME FRAME: 1501-1546

NOTE: Concurrent IK Data Point: Position 22.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	5.000E 03	2.094E 01	4.189E 02	4.879E 03	1.165E 01
2	30.	50.	20.	40.	7.100E 02	2.379E 01	4.758E 02	5.526E 03	1.161E 01
3	50.	80.	30.	65.	1.600E 02	2.301E 01	6.902E 02	7.905E 03	1.154E 01
4	80.	110.	30.	95.	5.600E 01	2.514E 01	7.542E 02	8.615E 03	1.142E 01
5	110.	150.	40.	130.	2.200E 01	2.531E 01	1.012E 03	1.140E 04	1.126E 01
6	150.	200.	50.	175.	1.000E 01	2.806E 01	1.403E 03	1.546E 04	1.102E 01
7	200.	250.	50.	225.	3.500E 00	2.087E 01	1.044E 03	1.122E 04	1.075E 01
8	250.	300.	50.	275.	1.600E 00	1.742E 01	8.711E 02	9.127E 03	1.048E 01
9	300.	350.	50.	325.	7.000E-01	1.258E 01	6.291E 02	6.427E 03	1.022E 01
10	350.	400.	50.	375.	4.000E-01	1.104E 01	5.522E 02	5.505E 03	9.969E 00
11	400.	450.	50.	425.	3.200E-01	1.286E 01	6.431E 02	6.260E 03	9.734E 00
12	450.	500.	50.	475.	1.100E-01	6.173E 00	3.086E 02	2.936E 03	9.514E 00
13	500.	550.	50.	525.	5.600E-02	4.243E 00	2.121E 02	1.974E 03	9.305E 00
14	550.	600.	50.	575.	4.000E-02	3.982E 00	1.991E 02	1.813E 03	9.108E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
9.214E 03	9.910E 04	2.686E 05	186

TOWER CONDITIONS: $\overline{V}_u$ = 11.7 m/s ; T_a =25.8 °C ; T_1 = 30.4 °C ; T_o =24.2 °C

Range: 6.2 °C ; Approach: 16.6 °C ; Heat Load: ~32.7 MW

AMBIENT CONDITIONS: Wind Speed: 15.2 Km/hr ; Wind Direction: N ; Twet/Tdry = 10.0/15.9 °C

DIAMETER: SW-NE 1 POSITION: 24 DATE: 2/26/74 TIME FRAME: 1617-1701

NOTE: Concurrent IK Data Point: Position 23.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	6.300E 03	2.639E 01	5.278E 02	7.277E 03	1.379E 01
2	30.	50.	20.	40.	7.900E 02	2.647E 01	5.295E 02	7.281E 03	1.375E 01
3	50.	80.	30.	65.	1.600E 02	2.301E 01	6.902E 02	9.442E 03	1.368E 01
4	80.	110.	30.	95.	4.500E 01	2.020E 01	6.060E 02	8.220E 03	1.356E 01
5	110.	150.	40.	130.	2.000E 01	2.301E 01	9.203E 02	1.233E 04	1.340E 01
6	150.	200.	50.	175.	8.900E 00	2.497E 01	1.249E 03	1.644E 04	1.316E 01
7	200.	250.	50.	225.	2.200E 00	1.312E 01	6.561E 02	8.455E 03	1.289E 01
8	250.	300.	50.	275.	6.300E-01	6.860E 00	3.430E 02	4.328E 03	1.262E 01
9	300.	350.	50.	325.	2.500E-01	4.494E 00	2.247E 02	2.776E 03	1.236E 01
10	350.	400.	50.	375.	1.000E-01	2.761E 00	1.381E 02	1.672E 03	1.211E 01
11	400.	450.	50.	425.	5.600E-02	2.251E 00	1.125E 02	1.336E 03	1.187E 01
12	450.	500.	50.	475.	4.000E-02	2.245E 00	1.122E 02	1.308E 03	1.165E 01
13	500.	550.	50.	525.	2.800E-02	2.121E 00	1.061E 02	1.214E 03	1.145E 01
14	550.	600.	50.	575.	2.500E-02	2.489E 00	1.244E 02	1.400E 03	1.125E 01

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
6.340E 03	8.347E 04	2.504E 05	145

TOWER CONDITIONS: $\overline{V}_u$ = 13.8 m/s ; T_a = 26.9°C ; T_i = 29.9 °C ; T_o = 23.9 °C

Range: 6.0 °C ; Approach: 16.7 °C ; Heat Load: ~ 31.6 MW

AMBIENT CONDITIONS: Wind Speed: 21.4 Km/hr ; Wind Direction: N ; T_{wet}/T_{dry} = 7.2/15.2 °C

DIAMETER: SW-NE 1 POSITION: 25 DATE: 2/26/74 TIME FRAME: 1724-1808

NOTE: Concurrent IK Data Point: Position 24.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	6.300E 03	2.639E 01	5.278E 02	6.248E 03	1.184E 01
2	30.	50.	20.	40.	1.300E 03	4.356E 01	8.713E 02	1.028E 04	1.180E 01
3	50.	80.	30.	65.	2.500E 02	3.595E 01	1.078E 03	1.265E 04	1.173E 01
4	80.	110.	30.	95.	4.500E 01	2.020E 01	6.060E 02	7.038E 03	1.161E 01
5	110.	150.	40.	130.	1.600E 01	1.841E 01	7.362E 02	8.428E 03	1.145E 01
6	150.	200.	50.	175.	4.000E 00	1.122E 01	5.612E 02	6.292E 03	1.121E 01
7	200.	250.	50.	225.	1.000E 00	5.964E 00	2.982E 02	3.262E 03	1.094E 01
8	250.	300.	50.	275.	3.500E-01	3.811E 00	1.906E 02	2.033E 03	1.067E 01
9	300.	350.	50.	325.	2.000E-01	3.595E 00	1.797E 02	1.870E 03	1.041E 01
10	350.	400.	50.	375.	1.100E-01	3.037E 00	1.519E 02	1.543E 03	1.016E 01
11	400.	450.	50.	425.	7.900E-02	3.175E 00	1.588E 02	1.576E 03	9.924E 00
12	450.	500.	50.	475.	5.600E-02	3.142E 00	1.571E 02	1.525E 03	9.704E 00
13	500.	550.	50.	525.	4.500E-02	3.409E 00	1.705E 02	1.619E 03	9.495E 00
14	550.	600.	50.	575.	3.200E-02	3.185E 00	1.593E 02	1.481E 03	9.298E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
5.847E 03	6.585E 04	2.166E 05	102

TOWER CONDITIONS: $\overline{V}_u$ = 11.9 m/s ; T_a = 27.9 °C ; T_i = 29.7 °C ; T_o = 23.6 °C

Range: 6.1 °C ; Approach: 16.4 °C ; Heat Load: ~32.2 MW

AMBIENT CONDITIONS: Wind Speed: 16.9 Km/hr ; Wind Direction: N ; T_{wet}/T_{dry} = 7.2/14.1 °C

DIAMETER: SW-NE 1 **POSITION:** 26 **DATE:** 2/26/74 **TIME FRAME:** 1830-1903

NOTE: Concurrent IK Data Point: Position 25.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	6.300E 03	2.639E 01	5.278E 02	6.327E 03	1.199E 01
2	30.	50.	20.	40.	1.400E 03	4.691E 01	9.383E 02	1.121E 04	1.195E 01
3	50.	80.	30.	65.	2.820E 02	4.055E 01	1.216E 03	1.445E 04	1.188E 01
4	80.	110.	30.	95.	5.600E 01	2.514E 01	7.542E 02	8.871E 03	1.176E 01
5	110.	150.	40.	130.	1.600E 01	1.841E 01	7.362E 02	8.539E 03	1.160E 01
6	150.	200.	50.	175.	4.000E 00	1.122E 01	5.612E 02	6.376E 03	1.136E 01
7	200.	250.	50.	225.	7.930E-01	4.712E 00	2.356E 02	2.612E 03	1.109E 01
8	250.	300.	50.	275.	3.500E-01	3.811E 00	1.906E 02	2.061E 03	1.082E 01
9	300.	350.	50.	325.	2.000E-01	3.595E 00	1.797E 02	1.897E 03	1.056E 01
10	350.	400.	50.	375.	1.300E-01	3.590E 00	1.795E 02	1.850E 03	1.031E 01
11	400.	450.	50.	425.	1.000E-01	4.019E 00	2.010E 02	2.025E 03	1.007E 01
12	450.	500.	50.	475.	6.300E-02	3.535E 00	1.768E 02	1.742E 03	9.854E 00
13	500.	550.	50.	525.	4.000E-02	3.031E 00	1.515E 02	1.462E 03	9.645E 00
14	550.	600.	50.	575.	2.000E-02	1.991E 00	9.954E 01	9.405E 02	9.448E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
6.148E 03	7.037E 04	2.477E 05	96

TOWER CONDITIONS: $\overline{V}_u = 12.0$ m/s ; $T_a = 27.2$ °C ; $T_i = 29.4$ °C ; $T_o = 23.4$ °C

Range: 6.0 °C ; Approach: 16.6 °C ; Heat Load: ~31.6 MW

AMBIENT CONDITIONS: Wind Speed: 18.6 Km/hr ; Wind Direction: N ; Twet/Tdry = 6.8/13.3 °C

DIAMETER: SW-NE 1 POSITION: 27 DATE: 2/26/74 TIME FRAME: 1940-1941

NOTE: Concurrent IK Data Point: Position NA

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(UP) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	6.300E 03	2.639E 01	5.278E 02	6.327E 03	1.199E 01
2	30.	50.	20.	40.	1.300E 03	4.356E 01	8.713E 02	1.041E 04	1.195E 01
3	50.	80.	30.	65.	2.240E 02	3.221E 01	9.663E 02	1.148E 04	1.199E 01
4	80.	110.	30.	95.	5.000E 01	2.245E 01	6.734E 02	7.921E 03	1.176E 01
5	110.	150.	40.	130.	1.300E 01	1.495E 01	5.982E 02	6.938E 03	1.160E 01
6	150.	200.	50.	175.	2.800E 00	7.857E 00	3.929E 02	4.463E 03	1.136E 01
7	200.	250.	50.	225.	7.100E -01	4.235E 00	2.117E 02	2.348E 03	1.109E 01
8	250.	300.	50.	275.	2.200E -01	2.396E 00	1.198E 02	1.296E 03	1.082E 01
9	300.	350.	50.	325.	1.000E -01	1.797E 00	8.987E 01	9.487E 02	1.056E 01
10	350.	400.	50.	375.	4.500E -02	1.242 E 00	6.210 E 01	6.403 E 02	1.031 E 01
11	400.	450.	50.	425.	2.200E -02	8.822 E-01	4.411 E 01	4.442 E 02	1.007 E 01
12	450.	500.	50.	475.	1.250E -02	7.013 E-01	3.506 E 01	3.455 E 02	9.854 E 00
13	500.	550.	50.	525.	7.100E -03	5.382 E-01	2.691 E 01	2.595 E 02	9.645 E 00
14	550.	600.	50.	575.	4.500E -03	4.478 E-01	2.239 E 01	2.115 E 02	9.448 E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
4.642E 03	5.403E 04	2.021E 05	79

TOWER CONDITIONS: $\overline{V}_U$ = 12.0 m/s ; T_a = 26.0 °C ; T_1 = 29.0 °C ; T_O = 23.3 °C

Range: 5.7 °C ; Approach: 17.2 °C ; Heat Load: ~ 30.0 MW

AMBIENT CONDITIONS: Wind Speed: 18.6 Km/hr ; Wind Direction: N ; Twet/Tdry = 6.1/10.7 °C

TURKEY POINT ISOKINETIC SAMPLING SUMMARY FOR DIAMETER SW-NE 1

IK Tube Position	Date	M_{Na} (μg)	M_{Mg} (μg)	V_s (m^3)	$\bar{v}_u$ (m/s)	$\frac{\bar{C}_{Na}}{C_{Na}}$	$\frac{\bar{C}_{Mg}}{C_{Mg}}$	F^a_{Na} (μg/m²·s)	F^a_{Mg} (μg/m²·s)	ΔA (m^2)	Δm^a_{Na} (μg/s)	Δm^a_{Mg} (μg/s)
0.3	2/23/74	3,468	385	20.98	5.3	1.25	1.17	1,095	114	3.25	3,559	371
1.3	2/23/74	2,868	335	28.71	9.7	1.25	1.17	1,211	132	3.62	4,384	478
2.3	2/23/74	2,323	275	24.92	12.4	1.25	1.17	1,445	160	3.33	4,812	533
3.3	2/25/74	3,313	375	24.38	13.4	1.41	1.35	2,568	278	3.04	7,807	845
4.3	2/25/74	2,948	335	22.32	13.1	1.41	1.35	2,440	265	2.74	6,686	726
5.3	2/25/74	2,123	250	14.46	10.9	1.41	1.35	2,256	254	2.45	5,527	622
22.3	2/26/74	2,798	310	17.55	10.0	1.30	1.24	2,073	219	2.52	5,224	552
23.3	2/26/74	3,073	345	19.36	12.7	1.30	1.24	2,621	281	2.81	7,365	790
24.3	2/26/74	2,713	310	14.92	13.5	1.30	1.24	3,191	348	3.10	9,892	1,079
25.3	2/26/74	2,673	308	19.20	11.7	1.30	1.24	2,118	233	3.39	7,180	790
										TOTALS:	62,436	6,786

TOTAL MASS EMISSION RATES ARE: m^a_{Na} = 62,436 μg/s and m^a_{Mg} = 6,786 μg/s if the basin water concentration equal the mean concentrations $\bar{C}_{Na}$ and $\bar{C}_{Mg}$ as listed in Table 1 , and if the water flow rate equals 1,262 kg/s (or 20,000 gpm).

MINERAL MASS EMISSION FRACTIONS: η_{Na} = 0.00051 %; η_{Mg} = 0.00051 %; η = 0.00051 %

TURKEY POINT ISOKINETIC DATA EXTENSION FOR DIAMETER SW-NE 1

Position	ϕ^a_{Na} ($\mu g/m^3$)	ϕ^a_{Mg} ($\mu g/m^3$)	$\bar{v}_u$ (m/s)	F^a_{Na} ($\mu g/m^2 \cdot s$)	F^a_{Mg} ($\mu g/m^2 \cdot s$)	ΔA (m^2)	Δm^a_{Na} ($\mu g/s$)	Δm^a_{Mg} ($\mu g/s$)
6.3	207	23.3	8.0	1656	186	2.16	3,577	402
7.3	207	23.3	4.85	1004	113	1.87	1,877	211
8.3	207	23.3	1.00	207	23.3	1.57	325	36.6
18.3	207	21.9	0.50	104	11.0	1.33	138	14.6
19.3	207	21.9	2.50	518	54.8	1.61	834	88.3
20.3	207	21.9	5.25	1087	115	1.93	2,098	222
21.3	207	21.9	7.40	1532	162	2.22	3,401	360
26.3	181	19.9	12.15	2199	242	6.13	13,480	1483
						TOTALS:	25,730	2818

UPPER LIMIT OF MINERAL MASS EMISSION FRACTIONS:

$\eta'_{Na} = 0.00072\%$ $\eta'_{Mg} = 0.00072\%$ $\eta' = 0.00072\%$

DIAMETER: SW-NE 2 **POSITION:** 1 **DATE:** 3/9/74 **TIME FRAME:** 1703-1803

NOTE: Concurrent IK Data Point: Position 0.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	4.000E 03	1.676E 01	3.351E 02	3.414E 03	1.019E 01
2	30.	50.	20.	40.	5.000E 02	1.676E 01	3.351E 02	3.402E 03	1.015E 01
3	50.	80.	30.	65.	4.500E 01	6.471E 00	1.941E 02	1.957E 03	1.008E 01
4	80.	110.	30.	95.	7.900E 00	3.546E 00	1.064E 02	1.060E 03	9.963E 00
5	110.	150.	40.	130.	2.500E 00	2.876E 00	1.150E 02	1.127E 03	9.798E 00
6	150.	200.	50.	175.	7.900E-01	2.217E 00	1.108E 02	1.060E 03	9.561E 00
7	200.	250.	50.	225.	2.800E-01	1.670E 00	8.350E 01	7.755E 02	9.288E 00
8	250.	300.	50.	275.	1.100E-01	1.198E 00	5.989E 01	5.400E 02	9.017E 00
9	300.	350.	50.	325.	4.500E-02	8.088E-01	4.044E 01	3.541E 02	8.756E 00
10	350.	400.	50.	375.	2.500E-02	6.903E-01	3.451E 01	2.937E 02	8.509E 00
11	400.	450.	50.	425.	1.300E-02	5.225E-01	2.613E 01	2.162E 02	8.274E 00
12	450.	500.	50.	475.	7.900E-03	4.433E-01	2.217E 01	1.785E 02	8.054E 00
13	500.	550.	50.	525.	4.500E-03	3.409E-01	1.705E 01	1.337E 02	7.845E 00
14	550.	600.	50.	575.	2.300E-03	2.787E-01	1.394E 01	1.066E 02	7.648E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
1.494E 03	1.462F 04	5.145E 04	62

TOWER CONDITIONS: $\overline{V}_u$ = 10.2 m/s ; T_a =33.0°C ; T_i = 35.9 °C ; T_o = 30.6 °C

Range: 5.3 °C ; Approach: 8.8 °C ; Heat Load: ∿27.9 MW

AMBIENT CONDITIONS: Wind Speed: 20.8 Km/hr ; Wind Direction: SE ; T_{wet}/T_{dry} =21.8/25.1 °C

DIAMETER: SW-NE 2 POSITION: 2 DATE: 3/9/74 TIME FRAME: 1828-1928

NOTE: Concurrent IK Data Point: Position 1.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	5.000E 03	2.094E 01	4.189E 02	4.770E 03	1.139E 01
2	30.	50.	20.	40.	5.600E 02	1.877E 01	3.753E 02	4.261E 03	1.135E 01
3	50.	80.	30.	65.	6.300E 01	9.059E 00	2.718E 02	3.066E 03	1.128E 01
4	80.	110.	30.	95.	1.300E 01	5.836E 00	1.751E 02	1.954E 03	1.116E 01
5	110.	150.	40.	130.	4.000E 00	4.601E 00	1.841E 02	2.024E 03	1.100E 01
6	150.	200.	50.	175.	1.400E 00	3.929E 00	1.964E 02	2.114E 03	1.076E 01
7	200.	250.	50.	225.	5.000E-01	2.982E 00	1.491E 02	1.564E 03	1.049E 01
8	250.	300.	50.	275.	2.500E-01	2.722E 00	1.361E 02	1.391E 03	1.022E 01
9	300.	350.	50.	325.	1.400E-01	2.516E 00	1.258E 02	1.253E 03	9.956E 00
10	350.	400.	50.	375.	7.100E-02	1.960E 00	9.802E 01	9.516E 02	9.709E 00
11	400.	450.	50.	425.	4.500E-02	1.809E 00	9.044E 01	8.568E 02	9.474E 00
12	450.	500.	50.	475.	3.100E-02	1.740E 00	8.698E 01	8.049E 02	9.254E 00
13	500.	550.	50.	525.	2.200E-02	1.667E 00	8.334E 01	7.539E 02	9.045E 00
14	550.	600.	50.	575.	1.600E-02	1.593E 00	7.963E 01	7.046E 02	8.848E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
2.471E 03	2.647E 04	8.708E 04	109

TOWER CONDITIONS: $\overline{V}_u$ = 11.4 m/s ; T_a = 33.3°C ; T_i = 36.0 °C ; T_o = 30.6 °C

Range: 5.4 °C ; Approach: 8.9 °C ; Heat Load: ~28.4 MW

AMBIENT CONDITIONS: Wind Speed: 20.8 Km/hr ; Wind Direction: SE ; Twet/Tdry = 21.7/24.3 °C

DIAMETER: SW-NE 2 POSITION: 3 DATE: 3/11/74 TIME FRAME: 1117-1217

NOTE: Concurrent IK Data Point: Position 2.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	6.300E 03	2.639E 01	5.278E 02	6.644E 03	1.259E 01
2	30.	50.	20.	40.	6.300E 02	2.111E 01	4.222E 02	5.300E 03	1.255E 01
3	50.	80.	30.	65.	7.900E 01	1.136E 01	3.408E 02	4.253E 03	1.249E 01
4	80.	110.	30.	95.	1.000E 01	4.489E 00	1.347E 02	1.665E 03	1.236E 01
5	110.	150.	40.	130.	4.000E 00	4.601E 00	1.841E 02	2.245E 03	1.220E 01
6	150.	200.	50.	175.	1.800E 00	5.051E 00	2.526E 02	3.021E 03	1.196E 01
7	200.	250.	50.	225.	7.900E-01	4.712E 00	2.356E 02	2.753E 03	1.169E 01
8	250.	300.	50.	275.	4.000E-01	4.356E 00	2.178E 02	2.486E 03	1.142E 01
9	300.	350.	50.	325.	2.000E-01	3.595E 00	1.797E 02	2.005E 03	1.116E 01
10	350.	400.	50.	375.	1.100E-01	3.037E 00	1.519E 02	1.657E 03	1.091E 01
11	400.	450.	50.	425.	7.100E-02	2.854E 00	1.427E 02	1.523E 03	1.067E 01
12	450.	500.	50.	475.	4.000E-02	2.245E 00	1.122E 02	1.173E 03	1.045E 01
13	500.	550.	50.	525.	2.200E-02	1.667E 00	8.334E 01	8.539E 02	1.025E 01
14	550.	600.	50.	575.	1.400E-02	1.394E 00	6.968E 01	7.001E 02	1.005E 01

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
3.055E 03	3.628E 04	1.088E 05	132

TOWER CONDITIONS: $\bar{V}_u$ = 12.6 m/s ; T_a = 33.0 °C ; T_i = 38.0 °C ; T_o = 31.4 °C

Range: 6.6 °C ; Approach: 11.2 °C ; Heat Load: ~ 34.8 MW

AMBIENT CONDITIONS: Wind Speed: 12.4 Km/hr ; Wind Direction: E-SE ; T_{wet}/T_{dry} = 20.2/25.9 °C

DIAMETER: SW-NE 2 POSITION: 4 DATE: 3/11/74 TIME FRAME: 1234-1334

NOTE: Concurrent IK Data Point: Position 3.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	6.300E 03	2.639E 01	5.278E 02	6.327E 03	1.199E 01
2	30.	50.	20.	40.	6.300E 02	2.111E 01	4.222E 02	5.046E 03	1.195E 01
3	50.	80.	30.	65.	6.300E 01	9.059E 00	2.718E 02	3.229E 03	1.188E 01
4	80.	110.	30.	95.	1.300E 01	5.836E 00	1.751E 02	2.059E 03	1.176E 01
5	110.	150.	40.	130.	4.500E 00	5.177E 00	2.071E 02	2.401E 03	1.160E 01
6	150.	200.	50.	175.	1.800E 00	5.051E 00	2.526E 02	2.869E 03	1.136E 01
7	200.	250.	50.	225.	7.900E-01	4.712E 00	2.356E 02	2.612E 03	1.109E 01
8	250.	300.	50.	275.	4.000E-01	4.356E 00	2.178E 02	2.356E 03	1.082E 01
9	300.	350.	50.	325.	2.000E-01	3.595E 00	1.797E 02	1.897E 03	1.056E 01
10	350.	400.	50.	375.	1.000E-01	2.761E 00	1.381E 02	1.423E 03	1.031E 01
11	400.	450.	50.	425.	5.000E-02	2.010E 00	1.005E 02	1.012E 03	1.007E 01
12	450.	500.	50.	475.	3.200E-02	1.796E 00	8.978E 01	8.847E 02	9.854E 00
13	500.	550.	50.	525.	1.800E-02	1.364E 00	6.819E 01	6.577E 02	9.645E 00
14	550.	600.	50.	575.	1.000E-02	9.954E-01	4.977E 01	4.702E 02	9.448E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
2.936E 03	3.325E 04	9.010E 04	124

TOWER CONDITIONS: $\overline{V}_u$ = 12.0 m/s ; T_a = 34.1 °C ; T_i = 38.0 °C ; T_o = 31.4 °C

Range: 6.6 °C ; Approach: 11.6 °C ; Heat Load: ~ 34.8MW

AMBIENT CONDITIONS: Wind Speed: 15.5 Km/hr ; Wind Direction: E-SE ; Twet/Tdry = 19.8/26.5 °C

DIAMETER: SW-NE 2 **POSITION:** 5 **DATE:** 3/11/74 **TIME FRAME:** 1434-1525

NOTE: Concurrent IK Data Point: Position 4.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/CM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	6.300E 03	2.639E 01	5.278E 02	5.377E 03	1.019E 01
2	30.	50.	20.	40.	6.300E 02	2.111E 01	4.222E 02	4.286E 03	1.015E 01
3	50.	80.	30.	65.	5.000E 01	7.190E 00	2.157E 02	2.174E 03	1.008E 01
4	80.	110.	30.	95.	1.100E 01	4.938E 00	1.481E 02	1.476E 03	9.963E 00
5	110.	150.	40.	130.	3.500E 00	4.026E 00	1.610E 02	1.578E 03	9.798E 00
6	150.	200.	50.	175.	1.000E 00	2.806E 00	1.403E 02	1.342E 03	9.561E 00
7	200.	250.	50.	225.	3.200E-01	1.909E 00	9.543E 01	8.863E 02	9.288E 00
8	250.	300.	50.	275.	1.300E-01	1.416E 00	7.078E 01	6.382E 02	9.017E 00
9	300.	350.	50.	325.	6.300E-02	1.132E 00	5.662E 01	4.958E 02	8.756E 00
10	350.	400.	50.	375.	3.500E-02	9.664E-01	4.832E 01	4.111E 02	8.509E 00
11	400.	450.	50.	425.	2.000E-02	8.039E-01	4.019E 01	3.326E 02	8.274E 00
12	450.	500.	50.	475.	1.300E-02	7.295E-01	3.647E 01	2.938E 02	8.054E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
1.563E 03	1.929E 04	4.668E 04	54

TOWER CONDITIONS: $\overline{V}_u$ =10.2 m/s ; T_a =33.7 °C ; T_i = 37.8 °C ; T_o = 31.7 °C

Range: 6.1 °C ; Approach: 10.5 °C ; Heat Load: ~ 32.1 MW

AMBIENT CONDITIONS: Wind Speed: 12.9 Km/hr ; Wind Direction: E-SE ; T_{wet}/T_{dry} = 21.2/26.0 °C

DIAMETER: SW-NE 2 **POSITION:** 6 **DATE:** 3/11/74 **TIME FRAME:** 1544-1645

NOTE: Concurrent IK Data Point: Position 5.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	5.000E 03	2.094E 01	4.189E 02	3.262E 03	7.788E 00
2	30.	50.	20.	40.	3.200E 02	1.072E 01	2.145E 02	1.663E 03	7.752E 00
3	50.	80.	30.	65.	3.500E 01	5.033E 00	1.510E 02	1.160E 03	7.680E 00
4	80.	110.	30.	95.	6.300E 00	2.828E 00	8.485E 01	6.417E 02	7.563E 00
5	110.	150.	40.	130.	1.800E 00	2.071E 00	8.283E 01	6.127E 02	7.398E 00
6	150.	200.	50.	175.	6.300E-01	1.768E 00	8.839E 01	6.330E 02	7.161E 00
7	200.	250.	50.	225.	2.200E-01	1.312E 00	6.561E 01	4.519E 02	6.888E 00
8	250.	300.	50.	275.	7.900E-02	8.602E-01	4.301E 01	2.846E 02	6.617E 00
9	300.	350.	50.	325.	2.800E-02	5.033E-01	2.516E 01	1.599E 02	6.356E 00
10	350.	400.	50.	375.	1.400E-02	3.866E-01	1.933E 01	1.181E 02	6.109E 00
11	400.	450.	50.	425.	8.000E-03	3.216E-01	1.608E 01	9.445E 01	5.874E 00
12	450.	500.	50.	475.	4.000E-03	2.245E-01	1.122E 01	6.345E 01	5.654E 00
13	500.	550.	50.	525.	2.000E-03	1.515E-01	7.577E 00	4.126E 01	5.445E 00
14	550.	600.	50.	575.	1.000E-03	9.354E-02	4.977E 00	2.612E 01	5.248E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
1.233E 03	9.211E 03	1.953E 04	49

TOWER CONDITIONS: $\overline{V}_u$ = 7.8 m/s ; T_a = 33.0 °C ; T_i = 37.8 °C ; T_o = 31.7 °C

Range: 6.1 °C ; Approach: 10.6 °C ; Heat Load: ~32.1 MW

AMBIENT CONDITIONS: Wind Speed: 18.0 Km/hr ; Wind Direction: E-SE ; Twet/Tdry = 21.1/25.4 °C

DIAMETER: SW-NE 2 **POSITION:** 21 **DATE:** 3/11/74 **TIME FRAME:** 1813-1913

NOTE: Concurrent IK Data Point: Position 20.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.000E 04	4.189E 01	8.378E 02	8.535E 03	1.019E 01
2	30.	50.	20.	40.	1.600E 03	5.362E 01	1.072E 03	1.089E 04	1.015E 01
3	50.	80.	30.	65.	4.500E 02	6.471E 01	1.941E 03	1.957E 04	1.008E 01
4	80.	110.	30.	95.	1.400E 02	6.285E 01	1.885E 03	1.878E 04	9.963E 00
5	110.	150.	40.	130.	5.000E 01	5.752E 01	2.301E 03	2.254E 04	9.798E 00
6	150.	200.	50.	175.	1.400E 01	3.929E 01	1.964E 03	1.878E 04	9.561E 00
7	200.	250.	50.	225.	5.600E 00	3.340E 01	1.670E 03	1.551E 04	9.288E 00
8	250.	300.	50.	275.	1.800E 00	1.960E 01	9.800E 02	8.837E 03	9.017E 00
9	300.	350.	50.	325.	5.600E-01	1.007E 01	5.033E 02	4.407E 03	8.756E 00
10	350.	400.	50.	375.	2.600E-01	7.731E 00	3.866E 02	3.289E 03	8.509E 00
11	400.	450.	50.	425.	1.300E-01	5.225E 00	2.613E 02	2.162E 03	8.274E 00
12	450.	500.	50.	475.	8.000E-02	4.489E 00	2.245E 02	1.808E 03	8.054E 00
13	500.	550.	50.	525.	5.600E-02	4.243E 00	2.121E 02	1.664E 03	7.845E 00
14	550.	600.	50.	575.	4.500E-02	4.479E 00	2.240E 02	1.713E 03	7.648E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
1.446E 04	1.385E 05	3.074E 05	136

TOWER CONDITIONS: $\overline{V}_u$ = 10.2 m/s ; T_a = 33.9°C ; T_i = 37.7 °C ; T_o = 31.7 °C

Range: 6.0 °C ; Approach: 10.6 °C ; Heat Load: ~31.6 MW

AMBIENT CONDITIONS: Wind Speed: 11.5 Km/hr ; Wind Direction: E-SE ; Twet/Tdry = 21.1/24.3 °C

DIAMETER: SW-NE 2 POSITION: 22 DATE: 3/12/74 TIME FRAME: 1133-1245

NOTE: Concurrent IK Data Point: Position 21.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	7.900E 03	3.309E 01	6.618E 02	8.332E 03	1.259E 01
2	30.	50.	20.	40.	2.000E 03	6.702E 01	1.340E 03	1.682E 04	1.255E 01
3	50.	80.	30.	65.	4.500E 02	6.471E 01	1.941E 03	2.422E 04	1.248E 01
4	80.	110.	30.	95.	1.600E 02	7.183E 01	2.155E 03	2.664E 04	1.236E 01
5	110.	150.	40.	130.	5.600E 01	6.442E 01	2.577E 03	3.144E 04	1.220E 01
6	150.	200.	50.	175.	2.000E 01	5.612E 01	2.806E 03	3.356E 04	1.196E 01
7	200.	250.	50.	225.	7.900E 00	4.712E 01	2.356E 03	2.754E 04	1.169E 01
8	250.	300.	50.	275.	2.500E 00	2.722E 01	1.361E 03	1.554E 04	1.142E 01
9	300.	350.	50.	325.	9.000E-01	1.618E 01	8.088E 02	9.026E 03	1.116E 01
10	350.	400.	50.	375.	4.000E-01	1.104E 01	5.522E 02	6.025E 03	1.091E 01
11	400.	450.	50.	425.	2.000E-01	8.039E 00	4.019E 02	4.288E 03	1.067E 01
12	450.	500.	50.	475.	1.100E-01	6.173E 00	3.086E 02	3.225E 03	1.045E 01
13	500.	550.	50.	525.	5.600E-02	4.243E 00	2.121E 02	2.174E 03	1.025E 01
14	550.	600.	50.	575.	2.800E-02	2.787E 00	1.394E 02	1.401E 03	1.005E 01

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
1.762E 04	2.102E 05	5.466E 05	152

TOWER CONDITIONS: $\overline{V}_u$ = 12.6 m/s ; T_a =33.5 °C ; T_1 = 38.0 °C ; T_o = 31.7 °C

Range: 6.3 °C ; Approach: 9.6 °C ; Heat Load: ~ 33.2 MW

AMBIENT CONDITIONS: Wind Speed: 9.1 Km/hr ; Wind Direction: S ; T_{wet}/T_{dry} = 22.1/27.0 °C

DIAMETER: SW-NE 2 **POSITION:** 23 **DATE:** 3/12/74 **TIME FRAME:** 1334-1434

NOTE: Concurrent IK Data Point: Position 22.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.000E 04	4.189E 01	8.378E 02	1.155E 04	1.379E 01
2	30.	50.	20.	40.	2.500E 03	8.379E 01	1.676E 03	2.304E 04	1.375E 01
3	50.	80.	30.	65.	1.000E 03	1.438E 02	4.314E 03	5.901E 04	1.368E 01
4	80.	110.	30.	95.	2.800E 02	1.257E 02	3.771E 03	5.114E 04	1.356E 01
5	110.	150.	40.	130.	8.900E 01	1.024E 02	4.095E 03	5.487E 04	1.340E 01
6	150.	200.	50.	175.	3.500E 01	9.822E 01	4.911E 03	6.463E 04	1.316E 01
7	200.	250.	50.	225.	1.600E 01	9.543E 01	4.771E 03	6.149E 04	1.289E 01
8	250.	300.	50.	275.	4.500E 00	4.900E 01	2.450E 03	3.091E 04	1.262E 01
9	300.	350.	50.	325.	1.400E 00	2.516E 01	1.258E 03	1.555E 04	1.236E 01
10	350.	400.	50.	375.	5.600E-01	1.546E 01	7.731E 02	9.361E 03	1.211E 01
11	400.	450.	50.	425.	2.800E-01	1.125E 01	5.627E 02	6.682E 03	1.187E 01
12	450.	500.	50.	475.	1.800E-01	1.010E 01	5.050E 02	5.886E 03	1.165E 01
13	500.	550.	50.	525.	1.100E-01	8.334E 00	4.167E 02	4.769E 03	1.145E 01
14	550.	600.	50.	575.	7.900E-02	7.864E 00	3.932E 02	4.423E 03	1.125E 01

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
3.073E 04	4.033E 05	1.129E 06	157

TOWER CONDITIONS: $\overline{V}_u$ = 13.8 m/s ; T_a = 34.5°C ; T_i = 37.8 °C ; T_o = 31.7 °C

Range: 6.1 °C ; Approach: 9.7 °C ; Heat Load: ~32.1 MW

AMBIENT CONDITIONS: Wind Speed: 11.9 Km/hr ; Wind Direction: S ; T_{wet}/T_{dry} = 22.0/27.1 °C

DIAMETER: SW-NE 2 **POSITION:** 24 **DATE:** 3/12/74 **TIME FRAME:** 1507-1600

NOTE: Concurrent IK Data Point: Position 23.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.600E 04	6.702E 01	1.340E 03	1.929E 04	1.439E 01
2	30.	50.	20.	40.	4.500E 03	1.508E 02	3.016E 03	4.328E 04	1.435E 01
3	50.	80.	30.	65.	1.400E 03	2.013E 02	6.039E 03	8.624E 04	1.428E 01
4	80.	110.	30.	95.	4.500E 02	2.020E 02	6.060E 03	8.583E 04	1.416E 01
5	110.	150.	40.	130.	1.400E 02	1.610E 02	6.442E 03	9.017E 04	1.400E 01
6	150.	200.	50.	175.	4.500E 01	1.263E 02	6.314E 03	8.689E 04	1.376E 01
7	200.	250.	50.	225.	1.300E 01	7.753E 01	3.877E 03	5.229E 04	1.349E 01
8	250.	300.	50.	275.	2.500E 00	2.722E 01	1.361E 03	1.799E 04	1.322E 01
9	300.	350.	50.	325.	1.000E 00	1.797E 01	8.987E 02	1.164E 04	1.296E 01
10	350.	400.	50.	375.	5.000E-01	1.381E 01	6.903E 02	8.773E 03	1.271E 01
11	400.	450.	50.	425.	2.300E-01	1.125E 01	5.627E 02	7.020E 03	1.247E 01
12	450.	500.	50.	475.	1.400E-01	7.856E 00	3.928E 02	4.813E 03	1.225E 01
13	500.	550.	50.	525.	9.000E-02	6.819E 00	3.409E 02	4.107E 03	1.205E 01
14	550.	600.	50.	575.	5.600E-02	5.574E 00	2.787E 02	3.302E 03	1.185E 01

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
3.751E 04	5.216E 05	1.638E 06	125

TOWER CONDITIONS: $\overline{V}_u$ = 14.4 m/s ; T_a = 36.0°C ; T_i = 37.7 °C ; T_o = 32.2 °C

Range: 5.5 °C ; Approach: 8.5 °C ; Heat Load: ~29.0 MW

AMBIENT CONDITIONS: Wind Speed: 19.3 Km/hr ; Wind Direction: S ; Twet/Tdry = 23.7/27.3 °C

DIAMETER: SW-NE 2 POSITION: 25 DATE: 3/12/74 TIME FRAME: 1653-1753

NOTE: Concurrent IK Data Point: Position 24.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CENT) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	2.000E 04	8.378E 01	1.676E 03	2.260E 04	1.349E 01
2	30.	50.	20.	40.	4.500E 03	1.508E 02	3.016E 03	4.057E 04	1.345E 01
3	50.	80.	30.	65.	1.300E 03	1.859E 02	5.508E 03	7.503E 04	1.338E 01
4	80.	110.	30.	95.	3.200E 02	1.437E 02	4.310E 03	5.716E 04	1.326E 01
5	110.	150.	40.	130.	7.100E 01	8.167E 01	3.267E 03	4.279E 04	1.310E 01
6	150.	200.	50.	175.	1.800E 01	5.051E 01	2.526E 03	3.248E 04	1.286E 01
7	200.	250.	50.	225.	3.500E 00	2.037E 01	1.044E 03	1.314E 04	1.259E 01
8	250.	300.	50.	275.	5.600E-01	6.098E 00	3.049E 02	3.755E 03	1.232E 01
9	300.	350.	50.	325.	1.600E-01	2.876E 00	1.438E 02	1.734E 03	1.206E 01
10	350.	400.	50.	375.	7.900E-02	2.181E 00	1.091E 02	1.288E 03	1.181E 01
11	400.	450.	50.	425.	4.500E-02	1.809E 00	9.044E 01	1.047E 03	1.157E 01
12	450.	500.	50.	475.	2.800E-02	1.571E 00	7.856E 01	8.920E 02	1.135E 01
13	500.	550.	50.	525.	1.600E-02	1.212E 00	6.061E 01	6.755E 02	1.115E 01
14	550.	600.	50.	575.	1.400E-02	1.394E 00	6.968E 01	7.629E 02	1.095E 01

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
2.220E 04	2.939E 05	1.008E 06	86

TOWER CONDITIONS: $\overline{V}_u$ = 13.5 m/s ; T_a = 35.5°C ; T_i = 37.5 °C ; T_o = 31.9 °C

Range: 5.6 °C ; Approach: 9.9 °C ; Heat Load: ~29.5 MW

AMBIENT CONDITIONS: Wind Speed: 11.9 Km/hr ; Wind Direction: S ; Twet/Tdry = 22.0/26.5 °C

DIAMETER: SW-NE 2 POSITION: 26 DATE: 3/12/74 TIME FRAME: 1813-1913

NOTE: Concurrent IK Data Point: Position 25.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.300E 04	5.445E 01	1.089E 03	1.436E 04	1.319E 01
2	30.	50.	20.	40.	2.500E 03	8.378E 01	1.676E 03	2.204E 04	1.315E 01
3	50.	80.	30.	65.	6.300E 02	9.059E 01	2.718E 03	3.555E 04	1.308E 01
4	80.	110.	30.	95.	1.300E 02	5.836E 01	1.751E 03	2.270E 04	1.296E 01
5	110.	150.	40.	130.	2.500E 01	2.876E 01	1.150E 03	1.472E 04	1.280E 01
6	150.	200.	50.	175.	3.500E 00	9.822E 00	4.911E 02	6.169E 03	1.256E 01
7	200.	250.	50.	225.	5.600E-01	3.340E 00	1.670E 02	2.052E 03	1.229E 01
8	250.	300.	50.	275.	2.000E-01	2.178E 00	1.089E 02	1.309E 03	1.202E 01
9	300.	350.	50.	325.	1.000E-01	1.797E 00	8.987E 01	1.057E 03	1.176E 01
10	350.	400.	50.	375.	5.000E-02	1.381E 00	6.903E 01	7.944E 02	1.151E 01
11	400.	450.	50.	425.	3.100E-02	1.246E 00	6.230E 01	7.024E 02	1.127E 01
12	450.	500.	50.	475.	2.200E-02	1.235E 00	6.173E 01	6.823E 02	1.105E 01
13	500.	550.	50.	525.	1.600E-02	1.212E 00	6.061E 01	6.574E 02	1.085E 01
14	550.	600.	50.	575.	1.200E-02	1.194E 00	5.972E 01	6.360E 02	1.065E 01

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
9.554E 03	1.234E 05	4.517E 05	72

TOWER CONDITIONS: $\overline{V}_u$ = 13.2 m/s ; T_a = 35.8°C ; T_i = 37.2 °C ; T_o = 31.7 °C

Range: 5.5 °C ; Approach: 10.4 °C ; Heat Load: ~29.0 MW

AMBIENT CONDITIONS: Wind Speed: 11.9 Km/hr ; Wind Direction: S ; T_{wet}/T_{dry} = 21.3/26.2 °C

TURKEY POINT ISOKINETIC SAMPLING SUMMARY FOR DIAMETER SW-NE 2

IK Tube Position	Date	M_{Na} (μg)	M_{Mg} (μg)	V_s (m^3)	$\bar{v}_u$ (m/s)	$\frac{\bar{C}_{Na}}{C_{Na}}$	$\frac{\bar{C}_{Mg}}{C_{Mg}}$	F^a_{Na} ($\mu g/m^2 \cdot s$)	F^a_{Mg} ($\mu g/m^2 \cdot s$)	ΔA (m^2)	Δm^a_{Na} (μg/s)	Δm^a_{Mg} (μg/s)
0.3	3/09/74	1,324	134	15.90	9.65	0.89	0.91	715	74	4.95	3,539	366
1.3	3/09/74	2,599	268	20.30	10.9	0.89	0.91	1,242	131	3.49	4,335	457
2.3	3/11/74	1,889	208	22.96	12.0	0.84	0.89	829	97	3.20	2,653	310
3.3	3/11/74	2,389	261	21.78	12.5	0.84	0.89	1,152	133	2.40	2,765	319
4.3	3/11/74	2,214	252	18.27	11.4	0.84	0.89	1,160	140	2.61	3,028	365
5.3	3/11/74	1,789	202	14.37	9.2	0.84	0.89	962	115	2.32	2,232	267
20.3	3/11/74	6,339	570	19.69	8.0	0.84	0.89	2,163	206	2.06	4,456	424
21.3	3/12/74	5,639	505	17.13	11.0	0.85	0.92	3,078	298	2.35	7,233	700
22.3	3/12/74	12,739	1,325	27.16	13.0	0.85	0.92	5,183	583	2.60	13,480	1,516
23.3	3/12/74	24,739	2,400	38.64	14.1	0.85	0.92	7,673	806	2.93	22,480	2,362
24.3	3/12/74	14,739	1,350	23.31	14.2	0.85	0.92	7,632	757	3.28	25,030	2,483
25.3	3/12/74	7,538	780	24.06	13.4	0.85	0.92	3,568	400	3.52	12,560	1,408
										TOTALS:	103,791	10,977

TOTAL MASS EMISSION RATES ARE: $m^a_{Na} = 103,791$ μg/s and $m^a_{Mg} = 10,977$ μg/s if the basin water concentration equal the mean concentrations $\bar{C}_{Na}$ and $\bar{C}_{Mg}$ as listed in Table 1 , and if the water flow rate equals 1,262 kg/s (or 20,000 gpm).

MINERAL MASS EMISSION FRACTIONS: $\eta_{Na} = 0.00085$ %; $\eta_{Mg} = 0.00083$ %; $\eta = 0.00084$ %

TURKEY POINT ISOKINETIC DATA EXTENSION FOR DIAMETER SW-NE 2

Position	ϕ^a_{Na} ($\mu g/m^3$)	ϕ^a_{Mg} ($\mu g/m^3$)	$\bar{v}_u$ (m/s)	F^a_{Na} ($\mu g/m^2 \cdot s$)	F^a_{Mg} ($\mu g/m^2 \cdot s$)	ΔA (m^2)	Δm^a_{Na} ($\mu g/s$)	Δm^a_{Mg} ($\mu g/s$)
6.3	105	12.5	3.0	315	37.5	2.03	639	76.1
7.3	105	12.5	0.2	21.0	2.5	1.71	35.9	4.3
17.3	270	25.8	0.4	108	10.3	1.19	129	12.3
18.3	270	25.8	1.8	486	46.4	1.48	719	68.7
19.3	270	25.8	4.1	1107	106	1.77	1959	188
26.3	266	29.9	12.5	3325	374	4.47	14,860	1672
						TOTALS:	18,342	2,021

UPPER LIMIT OF MINERAL MASS EMISSION FRACTIONS:

$\eta'_{Na} = 0.0010\%$ $\eta'_{Mg} = 0.00098\%$ $\eta' = 0.00099\%$

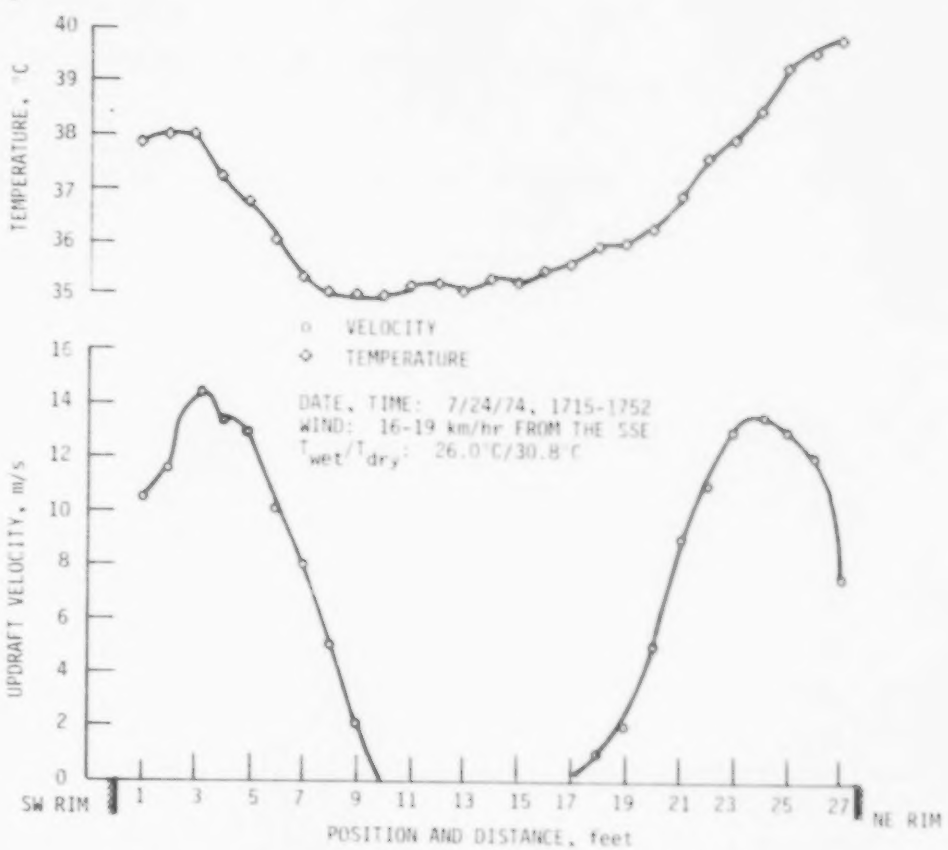

Figure 29. Velocity and temperature profiles, SW-NE diameter.

DIAMETER: SW-NE 3 **POSITION:** 1 **DATE:** 7/20/74 **TIME FRAME:** 1245-1315

NOTE: Concurrent IK Data Point: Position 0.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HIGH) (UM)	DEL D (UM)	D(CENT) (UM)	N(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	5.000E 03	2.094E 01	4.189E 02	4.184E 03	9.988E 00
2	30.	50.	20.	40.	7.000E 02	2.647E 01	5.295E 02	5.269E 03	9.952E 00
3	50.	80.	30.	65.	5.500E 01	7.909E 00	2.373E 02	2.344E 03	9.880E 00
4	80.	110.	30.	95.	5.300E 00	2.828E 00	8.485E 01	8.283E 02	9.763E 00
5	110.	150.	40.	130.	1.700E 00	1.956E 00	7.822E 01	7.508E 02	9.598E 00
6	150.	200.	50.	175.	3.500E-01	9.822E-01	4.911E 01	4.597E 02	9.361E 00
7	200.	250.	50.	225.	1.100E-01	6.561E-01	3.280E 01	2.981E 02	9.088E 00
8	250.	300.	50.	275.	2.900E-02	3.158E-01	1.579E 01	1.392E 02	8.817E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (μm)
1.446E 03	1.427E 04	5.267E 04	42

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TOWER CONDITIONS: $\overline{V}_u$ = 10.0 m/s ; T_a = 37.2 °C ; T_i = 42.8 °C ; T_o = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed: 16.1 Km/hr ; Wind Direction: ESE ; T_{wet}/T_{dry} = 24.2/31.8 °C

DIAMETER: SW-NE 3 **POSITION:** 2 **DATE:** 7/20/74 **TIME FRAME:** 1328-1402

NOTE: Concurrent IK Data Point: Position 1.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LO) (UM)	D(HI) (UM)	DEL D (UM)	D([illegible]) (UM)	P(D) (#/UM-M3)	DEL K/DEL D (UG/UM-M3)	DEL K (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	4.600E 03	1.927E 01	3.854E 02	4.812E 03	1.249E 01
2	30.	50.	20.	40.	5.300E 02	1.676E 01	3.351E 02	4.173E 03	1.245E 01
3	50.	80.	30.	65.	3.600E 01	5.177E 00	1.553E 02	1.923E 03	1.238E 01
4	80.	110.	30.	95.	7.000E 00	3.142E 00	9.427E 01	1.156E 03	1.226E 01
5	110.	150.	40.	130.	2.600E 00	2.991E 00	1.196E 02	1.447E 03	1.210E 01
6	150.	200.	50.	175.	1.300E 00	2.806E 00	1.403E 02	1.664E 03	1.186E 01
7	200.	250.	50.	225.	3.600E-01	2.147E 00	1.074E 02	1.244E 03	1.159E 01
8	250.	300.	50.	275.	1.400E-01	1.524E 00	7.622E 01	8.626E 02	1.132E 01
9	300.	350.	50.	325.	5.300E-02	1.132E 00	5.662E 01	6.260E 02	1.106E 01
10	350.	400.	50.	375.	3.200E-02	8.836E-01	4.418E 01	4.775E 02	1.081E 01
11	400.	450.	50.	425.	1.700E-02	6.833E-01	3.417E 01	3.613E 02	1.057E 01
12	450.	500.	50.	475.	8.900E -03	4.993E-01	2.496E 01	2.584 E 02	1.035E 01
13	500.	550.	50.	525.	5.600E -03	4.245E-01	2.122E 01	2.154 E 02	1.015E 01
14	550.	600.	50.	575.	3.500E -03	3.483E-01	1.741E 01	1.732 E 02	9.948E 00

K (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (μm)
1.612E 03	1.940E 04	6.654E 04	67

TOWER CONDITIONS: $\bar{V}_u$ = 12.5 m/s ; T_a = 37.0°C ; T_i = 42.8 °C ; T_o = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed: 16.1 Km/hr ; Wind Direction: ESE ; T_{wet}/T_{dry} = 24.2/31.8 °C

DIAMETER: SW-NE 3 **POSITION:** 3 **DATE:** 7/20/74 **TIME FRAME:** 1430-1501

NOTE: Concurrent IK Data Point: Position 2.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(L-I) (UM)	D(H-I) (UM)	DEL D (UM)	D(I) (UM)	P(D) (#/M3-UM)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	3.720E 03	1.553E 01	3.106E 02	4.956E 03	1.599E 01
2	30.	50.	20.	40.	4.750E 02	1.592E 01	3.183E 02	5.078E 03	1.595E 01
3	50.	80.	30.	65.	5.000E 01	7.190E 00	2.157E 02	3.425E 03	1.588E 01
4	80.	110.	30.	95.	1.330E 01	4.490E 00	1.347E 02	2.123E 03	1.576E 01
5	110.	150.	40.	130.	3.500E 00	4.026E 00	1.610E 02	2.512E 03	1.560E 01
6	150.	200.	50.	175.	1.750E 00	4.911E 00	2.455E 02	3.772E 03	1.536E 01
7	200.	250.	50.	225.	6.000E-01	4.771E 00	2.386E 02	3.599E 03	1.509E 01
8	250.	300.	50.	275.	5.000E-01	5.445E 00	2.722E 02	4.034E 03	1.482E 01
9	300.	350.	50.	325.	2.400E-01	4.314E 00	2.157E 02	3.140E 03	1.456E 01
10	350.	400.	50.	375.	1.250E-01	3.451E 00	1.726E 02	2.469E 03	1.431E 01
11	400.	450.	50.	425.	4.500E-02	1.809E 00	9.044E 01	1.273E 03	1.407E 01
12	450.	500.	50.	475.	1.700E-02	9.540E-01	4.770E 01	6.608E 02	1.385E 01
13	500.	550.	50.	525.	7.100 E-03	5.382 E-01	2.691 E 01	3.673E 02	1.365 E 01
14	550.	600.	50.	575.	3.200 E-03	3.134 E-01	1.592 E 01	2.141E 02	1.345 E 01

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (μm)
2.464E 03	3.762E 04	1.181E 05	169

TOWER CONDITIONS: $\overline{V}_u$ = 16.0 m/s ; T_a = 37.0°C ; T_1 = 42.5 °C ; T_o = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed:14.5 Km/hr ; Wind Direction: ESE ; T_{wet}/T_{dry} = 23.9/31.0 °C

DIAMETER: SW-NE 3 **POSITION:** 4 **DATE:** 7/20/74 **TIME FRAME:** 1656-1733

NOTE: Concurrent IK Data Point: Position 3.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	[illegible] (UM)	[illegible] (UM)	[illegible] (UM)	[illegible] (UM)	N(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	[illegible]	2.396E 01	4.189E 02	5.775E 03	1.379E 01
2	30.	50.	20.	40.	[illegible]	1.676E 01	3.351E 02	4.608E 03	1.375E 01
3	50.	[illegible]	[illegible]	[illegible]	[illegible]	7.621E 00	2.286E 02	3.128E 03	1.368E 01
4	[illegible]	110.	[illegible]	[illegible]	[illegible]	[illegible]	1.616E 02	2.192E 03	1.356E 01
5	110.	150.	40.	130.	[illegible]	[illegible]	2.669E 02	3.576E 03	1.340E 01
6	150.	200.	50.	175.	[illegible]	7.717E 00	3.858E 02	5.078E 03	1.316E 01
7	200.	250.	50.	225.	[illegible]	9.543E 00	4.771E 02	6.149E 03	1.289E 01
8	250.	300.	50.	275.	[illegible]	9.038E 00	4.519E 02	5.702E 03	1.262E 01
9	300.	350.	50.	325.	[illegible]	1.025E 01	5.123E 02	6.330E 03	1.236E 01
10	350.	400.	50.	375.	[illegible]	9.664E 00	4.832E 02	5.851E 03	1.211E 01
11	400.	450.	50.	425.	[illegible]	1.005E 01	5.024E 02	5.966E 03	1.187E 01
12	450.	500.	50.	475.	[illegible]	1.122E 01	5.612E 02	6.533E 03	1.165E 01
13	500.	550.	50.	525.	[illegible]	1.136E 01	5.682E 02	6.504E 03	1.145E 01
14	550.	600.	50.	575.	[illegible]	1.194E 01	5.972E 02	6.718E 03	1.125E 01

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (μm)
[illegible]	7.412E 04	2.105E 05	324

TOWER CONDITIONS: $\overline{V}_u$ = 13.8 m/s ; T_a = 36.1°C ; T_i = 42.8 °C ; T_o = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed: 19.3 Km/hr ; Wind Direction: ESE ; T_{wet}/T_{dry} = 24.6/31.0 °C

DIAMETER: SW-NE 3 POSITION: 5 DATE: 7/20/74 TIME FRAME: 1756-1826

NOTE: Concurrent IK Data Point: Position 4.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

N	D(LOW) (UM)	D(HIGH) (UM)	DEL (UM)	D(AVG) (UM)	N(D) (NO/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	3.611E 03	2.681E 01	5.362E 02	6.695E 03	1.249E 01
2	30.	50.	20.	40.	9.211E 02	1.072E 01	2.145E 02	2.671E 03	1.245E 01
3	50.	80.	30.	65.	6.533E 01	9.347E 00	2.804E 02	3.471E 03	1.238E 01
4	80.	110.	30.	95.	1.733E 01	7.632E 00	2.289E 02	2.808E 03	1.226E 01
5	110.	150.	40.	130.	5.403E 00	6.672E 00	2.669E 02	3.229E 03	1.210E 01
6	150.	200.	50.	175.	2.333E 00	6.454E 00	3.227E 02	3.828E 03	1.186E 01
7	200.	250.	50.	225.	1.153E 00	6.859E 00	3.429E 02	3.974E 03	1.159E 01
8	250.	300.	50.	275.	5.333E-01	5.445E 00	2.722E 02	3.081E 03	1.132E 01
9	300.	350.	50.	325.	2.400E-01	4.314E 00	2.157E 02	2.385E 03	1.106E 01
10	350.	400.	50.	375.	1.333E-01	3.728E 00	1.864E 02	2.014E 03	1.081E 01
11	400.	450.	50.	425.	9.333E-02	3.738E 00	1.869E 02	1.976E 03	1.057E 01
12	450.	500.	50.	475.	7.333E-02	3.928E 00	1.964E 02	2.033E 03	1.035E 01
13	500.	550.	50.	525.	5.333E-02	3.788E 00	1.894E 02	1.922E 03	1.015E 01
14	550.	600.	50.	575.	3.600E-02	3.583E 00	1.792E 02	1.782E 03	9.948E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (μm)
[illegible] 03	4.187E 04	1.088E 05	194

TOWER CONDITIONS: $\overline{V}_u$ = 12.5 m/s ; T_a = 36.9 °C ; T_1 = 43.1 °C ; T_0 = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed: 16.1 Km/hr ; Wind Direction: SE ; Twet/Tdry = 25.5/29.5 °C

DIAMETER: SW-NE 3 POSITION: 6 DATE: 7/22/74 TIME FRAME: 1418-1505

NOTE: Concurrent IK Data Point: Position 5.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	6.100E 03	2.555E 01	5.110E 02	5.615E 03	1.099E 01
2	30.	50.	20.	40.	5.650E 02	1.893E 01	3.787E 02	4.147E 03	1.095E 01
3	50.	80.	30.	65.	5.000E 01	7.190E 00	2.157E 02	2.347E 03	1.088E 01
4	80.	110.	30.	95.	1.600E 01	7.183E 00	2.155E 02	2.319E 03	1.076E 01
5	110.	150.	40.	130.	5.800E 00	6.672E 00	2.669E 02	2.828E 03	1.060E 01
6	150.	200.	50.	175.	2.400E 00	6.735E 00	3.367E 02	3.489E 03	1.036E 01
7	200.	250.	50.	225.	1.130E 00	6.739E 00	3.370E 02	3.399E 03	1.009E 01
8	250.	300.	50.	275.	7.000E-01	7.622E 00	3.811E 02	3.741E 03	9.817E 00
9	300.	350.	50.	325.	5.000E-01	8.987E 00	4.494E 02	4.294E 03	9.556E 00
10	350.	400.	50.	375.	4.000E-01	1.104E 01	5.522E 02	5.140E 03	9.309E 00
11	400.	450.	50.	425.	3.200E-01	1.286E 01	6.431E 02	5.836E 03	9.074E 00
12	450.	500.	50.	475.	2.750E-01	1.543E 01	7.716E 02	6.831E 03	8.854E 00
13	500.	550.	50.	525.	2.250E-01	1.705E 01	8.524E 02	7.369E 03	8.645E 00
14	550.	600.	50.	575.	1.800E-01	1.792E 01	8.959E 02	7.568E 03	8.448E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (µm)
6.807E 03	6.493E 04	1.441E 05	378

TOWER CONDITIONS: $\overline{V}_u$ = 11.0 m/s ; T_a = 35.2°C ; T_1 = 42.3 °C ; T_0 = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed: 8.0 Km/hr ; Wind Direction: S ; T_{wet}/T_{dry} = 21.7/27.9 °C

DIAMETER: SW-NE 3 **POSITION:** 7 **DATE:** 7/22/74 **TIME FRAME:** 1523-1610

NOTE: Concurrent IK Data Point: Position 6.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	8.000E 03	3.351E 01	6.702E 02	4.549E 03	6.788E 00
2	30.	50.	20.	40.	8.000E 02	2.681E 01	5.362E 02	3.620E 03	6.752E 00
3	50.	80.	30.	65.	7.500E 01	1.078E 01	3.235E 02	2.161E 03	6.680E 00
4	80.	110.	30.	95.	1.800E 01	8.081E 00	2.424E 02	1.591E 03	6.563E 00
5	110.	150.	40.	130.	4.700E 00	5.407E 00	2.163E 02	1.384E 03	6.398E 00
6	150.	200.	50.	175.	1.500E 00	4.209E 00	2.105E 02	1.297E 03	6.161E 00
7	200.	250.	50.	225.	5.500E-01	3.280E 00	1.640E 02	9.657E 02	5.888E 00
8	250.	300.	50.	275.	2.400E-01	2.613E 00	1.307E 02	7.340E 02	5.617E 00
9	300.	350.	50.	325.	1.000E-01	1.797E 00	8.987E 01	4.814E 02	5.356E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (µm)
2.584E 03	1.678E 04	3.357E 04	58

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TOWER CONDITIONS: $\overline{V}_u$ = 6.8 m/s ; T_a = 34.0°C ; T_1 = 43.1 °C ; T_o = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed: 20.9 Km/hr ; Wind Direction: SSW ; Twet/Tdry = 25.6/29.7 °C

DIAMETER: SW-NE 3 **POSITION:** 8 **DATE:** 7/23/74 **TIME FRAME:** 1144-1218

NOTE: Concurrent IK Data Point: Position 7.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	2.500E 03	1.047E 01	2.094E 02	7.514E 02	3.588E 00
2	30.	50.	20.	40.	2.500E 02	8.378E 00	1.676E 02	5.951E 02	3.552E 00
3	50.	80.	30.	65.	3.700E 01	5.320E 00	1.596E 02	5.594E 02	3.480E 00
4	80.	110.	30.	95.	7.000E 00	3.142E 00	9.427E 01	3.170E 02	3.363E 00
5	110.	150.	40.	130.	1.700E 00	1.956E 00	7.822E 01	2.501E 02	3.198E 00
6	150.	200.	50.	175.	5.000E-01	1.403E 00	7.015E 01	2.077E 02	2.961E 00
7	200.	250.	50.	225.	1.500E-01	8.946E-01	4.473E 01	1.202E 02	2.688E 00
8	250.	300.	50.	275.	6.400E-02	7.405E-01	3.702E 01	8.948E 01	2.417E 00
9	300.	350.	50.	325.	3.300E-02	5.931E-01	2.966E 01	6.395E 01	2.156E 00
10	350.	400.	50.	375.	2.300E-02	6.351E-01	3.175E 01	6.060E 01	1.909E 00
11	400.	450.	50.	425.	1.500E-02	6.029E-01	3.015E 01	5.048E 01	1.674E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (μm)
9.526E 02	3.062E 03	5.052E 03	69

TOWER CONDITIONS: $\overline{V}_u$ = 3.6 m/s ; T_a = 33.8°C ; T_i = 41.7 °C ; T_o = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed: 12.9 Km/hr ; Wind Direction: SE ; Twet/Tdry = 24.7/31.4 °C

DIAMETER: SW-NE 3 POSITION: 20 DATE: 7/24/74 TIME FRAME: 1616-1645

NOTE: Concurrent IK Data Point: Position 19.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	2.300E 04	9.634E 01	1.927E 03	1.539E 04	7.988E 00
2	30.	50.	20.	40.	3.200E 03	1.072E 02	2.145E 03	1.705E 04	7.952E 00
3	50.	80.	30.	65.	6.250E 02	8.987E 01	2.696E 03	2.125E 04	7.880E 00
4	80.	110.	30.	95.	1.000E 02	4.489E 01	1.347E 03	1.045E 04	7.763E 00
5	110.	150.	40.	130.	2.000E 01	2.301E 01	9.203E 02	6.992E 03	7.598E 00
6	150.	200.	50.	175.	4.000E 00	1.122E 01	5.612E 02	4.131E 03	7.361E 00
7	200.	250.	50.	225.	1.300E 00	7.753E 00	3.877E 02	2.748E 03	7.088E 00
8	250.	300.	50.	275.	4.200E-01	4.573E 00	2.287E 02	1.559E 03	6.817E 00
9	300.	350.	50.	325.	1.750E-01	3.145E 00	1.573E 02	1.031E 03	6.556E 00
10	350.	400.	50.	375.	7.000E-02	1.933E 00	9.664E 01	6.097E 02	6.309E 00
11	400.	450.	50.	425.	3.200E-02	1.286E 00	6.431E 01	3.907E 02	6.074E 00
12	450.	500.	50.	475.	1.500E-02	3.417E-01	4.209E 01	2.464E 02	5.854E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (μm)
1.057E 04	3.185E 04	1.498E 05	64

TOWER CONDITIONS: $\overline{V}_u$ = 8.0 m/s ; T_a = 35.0°C ; T_i = 43.3 °C ; T_o = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed: 18.5 Km/hr ; Wind Direction: SSE ; T_{wet}/T_{dry} = 26.1/28.1 °C

DIAMETER: SW-NE 3 **POSITION:** 21 **DATE:** 7/24/74 **TIME FRAME:** 1525-1554

NOTE: Concurrent IK Data Point: Position 20.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

#	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	2.100E 04	8.378E 01	1.676E 03	1.673E 04	9.988E 00
2	30.	50.	20.	40.	4.000E 03	1.340E 02	2.681E 03	2.668E 04	9.952E 00
3	50.	80.	30.	65.	1.200E 03	1.726E 02	5.177E 03	5.114E 04	9.880E 00
4	80.	110.	30.	95.	3.600E 02	1.616E 02	4.848E 03	4.733E 04	9.763E 00
5	110.	150.	40.	130.	1.000E 02	1.150E 02	4.601E 03	4.416E 04	9.598E 00
6	150.	200.	50.	175.	2.500E 01	7.015E 01	3.508E 03	3.284E 04	9.361E 00
7	200.	250.	50.	225.	8.000E 00	4.771E 01	2.386E 03	2.168E 04	9.088E 00
8	250.	300.	50.	275.	2.700E 00	2.940E 01	1.470E 03	1.296E 04	8.817E 00
9	300.	350.	50.	325.	1.200E 00	2.157E 01	1.078E 03	9.227E 03	8.556E 00
10	350.	400.	50.	375.	5.400E-01	1.491E 01	7.455E 02	6.194E 03	8.309E 00
11	400.	450.	50.	425.	2.100E-01	8.441E 00	4.220E 02	3.408E 03	8.074E 00
12	450.	500.	50.	475.	1.000E-01	5.612E 00	2.806E 02	2.204E 03	7.854E 00
13	500.	550.	50.	525.	5.000E-02	3.788E 00	1.894E 02	1.448E 03	7.645E 00
14	550.	600.	50.	575.	2.500E-02	2.489E 00	1.244E 02	9.267E 02	7.448E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (μm)
2.919E 04	2.769E 05	5.871E 05	112

TOWER CONDITIONS: $\overline{V}_u$ = 10.0 m/s ; T_a = 36.2°C ; T_1 = 42.7 °C ; T_0 = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed: 17.7 Km/hr ; Wind Direction: SSE ; Twet/Tdry = 26.7/30.6 °C

DIAMETER: SW-NE 3 **POSITION:** 22 **DATE:** 7/24/74 **TIME FRAME:** 1430-1500

NOTE: Concurrent IK Data Point: Position 21.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	2.000E 04	8.378E 01	1.676E 03	1.841E 04	1.099E 01
2	30.	50.	20.	40.	2.700E 03	9.048E 01	1.810E 03	1.982E 04	1.095E 01
3	50.	80.	30.	65.	1.100E 03	1.582E 02	4.745E 03	5.163E 04	1.088E 01
4	80.	110.	30.	95.	3.200E 02	1.437E 02	4.310E 03	4.638E 04	1.076E 01
5	110.	150.	40.	130.	9.000E 01	1.035E 02	4.141E 03	4.389E 04	1.060E 01
6	150.	200.	50.	175.	2.300E 01	6.454E 01	3.227E 03	3.344E 04	1.036E 01
7	200.	250.	50.	225.	6.500E 00	3.877E 01	1.938E 03	1.955E 04	1.009E 01
8	250.	300.	50.	275.	2.200E 00	2.396E 01	1.198E 03	1.176E 04	9.817E 00
9	300.	350.	50.	325.	1.000E 00	1.797E 01	8.987E 02	8.588E 03	9.556E 00
10	350.	400.	50.	375.	3.600E-01	9.940E 00	4.970E 02	4.626E 03	9.309E 00
11	400.	450.	50.	425.	1.200E-01	4.823E 00	2.412E 02	2.188E 03	9.074E 00
12	450.	500.	50.	475.	5.400E-02	3.030E 00	1.515E 02	1.341E 03	8.854E 00
13	500.	550.	50.	525.	3.300E-02	2.500E 00	1.250E 02	1.081E 03	8.645E 00
14	550.	600.	50.	575.	1.700E-02	1.692E 00	8.461E 01	7.148E 02	8.448E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (μm)
2.504E 04	2.634E 05	6.375E 05	110

TOWER CONDITIONS: $\overline{V}_u$ = 11.0 m/s ; T_a = 38.8 °C ; T_1 = 42.8 °C ; T_0 = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed: 12.9 Km/hr ; Wind Direction: SSE ; T_{wet}/T_{dry} = 26.1/31.7 °C

DIAMETER: SW-NE 3 **POSITION:** 23 **DATE:** 7/24/74 **TIME FRAME:** 1338-1408

NOTE: Concurrent IK Data Point: Position 22.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.200E 04	5.027E 01	1.005E 03	1.255E 04	1.249E 01
2	30.	50.	20.	40.	3.000E 03	1.005E 02	2.011E 03	2.504E 04	1.245E 01
3	50.	80.	30.	65.	9.000E 02	1.294E 02	3.882E 03	4.806E 04	1.238E 01
4	80.	110.	30.	95.	3.250E 02	1.459E 02	4.377E 03	5.367E 04	1.226E 01
5	110.	150.	40.	130.	1.150E 02	1.323E 02	5.292E 03	6.402E 04	1.210E 01
6	150.	200.	50.	175.	3.500E 01	9.822E 01	4.911E 03	5.825E 04	1.186E 01
7	200.	250.	50.	225.	1.200E 01	7.157E 01	3.578E 03	4.147E 04	1.159E 01
8	250.	300.	50.	275.	3.800E 00	4.138E 01	2.069E 03	2.341E 04	1.132E 01
9	300.	350.	50.	325.	1.400E 00	2.516E 01	1.258E 03	1.391E 04	1.106E 01
10	350.	400.	50.	375.	7.500E-01	2.071E 01	1.035E 03	1.119E 04	1.081E 01
11	400.	450.	50.	425.	4.300E-01	1.728E 01	8.642E 02	9.138E 03	1.057E 01
12	450.	500.	50.	475.	2.300E-01	1.291E 01	6.453E 02	6.681E 03	1.035E 01
13	500.	550.	50.	525.	1.300E-01	9.850E 00	4.925E 02	4.996E 03	1.015E 01
14	550.	600.	50.	575.	8.000E-02	7.963E 00	3.982E 02	3.961E 03	9.948E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (μm)
3.182E 04	3.764E 05	1.020E 06	145

TOWER CONDITIONS: $\overline{V}_u$ = 12.5 m/s ; T_a = 38.8°C ; T_1 = 42.8°C ; T_o = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed: 12.9 Km/hr ; Wind Direction: ESE ; T_{wet}/T_{dry} = 26.4/31.9 °C

DIAMETER: SW-NE 3 POSITION: 24 DATE: 7/23/74 TIME FRAME: 1743-1843

NOTE: Concurrent IK Data Point: Position 23.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(UP) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.000E 04	4.189E 01	8.378E 02	1.029E 04	1.229E 01
2	30.	50.	20.	40.	2.000E 03	6.702E 01	1.340E 03	1.642E 04	1.225E 01
3	50.	80.	30.	65.	4.000E 02	5.752E 01	1.726E 03	2.102E 04	1.218E 01
4	80.	110.	30.	95.	1.150E 02	5.163E 01	1.549E 03	1.868E 04	1.206E 01
5	110.	150.	40.	130.	4.300E 01	4.946E 01	1.979E 03	2.354E 04	1.190E 01
6	150.	200.	50.	175.	1.200E 01	3.367E 01	1.684E 03	1.963E 04	1.166E 01
7	200.	250.	50.	225.	3.750E 00	2.237E 01	1.118E 03	1.273E 04	1.139E 01
8	250.	300.	50.	275.	1.250E 00	1.361E 01	6.806E 02	7.566E 03	1.112E 01
9	300.	350.	50.	325.	5.500E-01	9.886E 00	4.943E 02	5.366E 03	1.086E 01
10	350.	400.	50.	375.	2.700E-01	7.455E 00	3.728E 02	3.954E 03	1.061E 01
11	400.	450.	50.	425.	1.500E-01	6.029E 00	3.015E 02	3.127E 03	1.037E 01
12	450.	500.	50.	475.	9.000E-02	5.050E 00	2.525E 02	2.564E 03	1.015E 01
13	500.	550.	50.	525.	6.000E-02	4.546E 00	2.273E 02	2.261E 03	9.945E 00
14	550.	600.	50.	575.	4.000E-02	3.982E 00	1.991E 02	1.941E 03	9.748E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (µm)
1.276E 04	1.491E 05	4.473E 05	129

TOWER CONDITIONS: $\overline{V}_u$ = 12.3 m/s ; T_a = 37.6°C ; T_1 = 42.1 °C ; T_o = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed: 10.5 Km/hr ; Wind Direction: NW ; Twet/Tdry = 24.7/27.1 °C

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DIAMETER: SW-NE 3 **POSITION:** 25 **DATE:** 7/23/74 **TIME FRAME:** 1654-1722

NOTE: Concurrent IK Data Point: Position 24.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.300E 04	5.445E 01	1.089E 03	1.218E 04	1.119E 01
2	30.	50.	20.	40.	3.200E 03	1.072E 02	2.145E 03	2.392E 04	1.115E 01
3	50.	80.	30.	65.	7.000E 02	1.007E 02	3.020E 03	3.346E 04	1.108E 01
4	90.	110.	30.	95.	1.400E 02	6.285E 01	1.885E 03	2.057E 04	1.096E 01
5	110.	150.	40.	130.	3.400E 01	3.911E 01	1.564E 03	1.689E 04	1.080E 01
6	150.	200.	50.	175.	7.500E 00	2.105E 01	1.052E 03	1.111E 04	1.056E 01
7	200.	250.	50.	225.	2.200E 00	1.312E 01	6.561E 02	6.749E 03	1.029E 01
8	250.	300.	50.	275.	6.600E-01	7.187E 00	3.593E 02	3.600E 03	1.002E 01
9	300.	350.	50.	325.	3.000E-01	5.392E 00	2.696E 02	2.630E 03	9.756E 00
10	350.	400.	50.	375.	1.700E-01	4.694E 00	2.347E 02	2.232E 03	9.509E 00
11	400.	450.	50.	425.	1.200E-01	4.823E 00	2.412E 02	2.237E 03	9.274E 00
12	450.	500.	50.	475.	8.000E-02	4.489E 00	2.245E 02	2.032E 03	9.054E 00
13	500.	550.	50.	525.	5.800E-02	4.394E 00	2.197E 02	1.944E 03	8.845E 00
14	550.	600.	50.	575.	3.500E-02	3.484E 00	1.742E 02	1.506E 03	8.648E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (μm)
1.313E 04	1.412E 05	4.644E 05	85

TOWER CONDITIONS: $\dot{\overline{V}}_u$ = 11.2 m/s ; T_a = 39.0°C ; T_i = 41.7 °C ; T_o = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed: 12.1 Km/hr ; Wind Direction: SW ; Twet/Tdry = 24.4/29.2 °C

DIAMETER: SW-NE 3 **POSITION:** 26 **DATE:** 7/23/74 **TIME FRAME:** 1435-1500

NOTE: Concurrent IK Data Point: Position 25.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.700E 04	7.121E 01	1.424E 03	1.650E 04	1.159E 01
2	30.	50.	20.	40.	5.800E 03	1.944E 02	3.887E 03	4.490E 04	1.155E 01
3	50.	80.	30.	65.	1.500E 03	2.157E 02	6.471E 03	7.428E 04	1.148E 01
4	80.	110.	30.	95.	4.400E 02	1.975E 02	5.926E 03	6.733E 04	1.136E 01
5	110.	150.	40.	130.	1.300E 02	1.495E 02	5.982E 03	6.698E 04	1.120E 01
6	150.	200.	50.	175.	2.600E 01	7.357E 01	3.929E 03	4.306E 04	1.096E 01
7	200.	250.	50.	225.	8.500E 00	5.070E 01	2.535E 03	2.709E 04	1.069E 01
8	250.	300.	50.	275.	4.000E 00	4.356E 01	2.178E 03	2.269E 04	1.042E 01
9	300.	350.	50.	325.	2.300E 00	4.134E 01	2.067E 03	2.099E 04	1.016E 01
10	350.	400.	50.	375.	1.500E 00	4.142E 01	2.071E 03	2.052E 04	9.909E 00
11	400.	450.	50.	425.	1.100E 00	4.421E 01	2.211E 03	2.139E 04	9.674E 00
12	450.	500.	50.	475.	8.000E-01	4.489E 01	2.245E 03	2.122E 04	9.454E 00
13	500.	550.	50.	525.	6.500E-01	4.925E 01	2.462E 03	2.277E 04	9.245E 00
14	550.	600.	50.	575.	5.700E-01	5.674E 01	2.837E 03	2.567E 04	9.048E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (μm)
4.622E 04	4.954E 05	1.744E 06	146

TOWER CONDITIONS: $\overline{V}_u$ = 11.6 m/s ; T_a = 38.3°C ; T_1 = 41.7 °C ; T_o = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed: 12.1 Km/hr ; Wind Direction: SW ; Twet/Tdry = 24.4/29.2 °C

DIAMETER: SW-NE 3 **POSITION:** 27 **DATE:** 7/23/74 **TIME FRAME:** 1340-1412

NOTE: Concurrent IK Data Point: Position 26.6

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	8.000E 03	3.351E 01	6.702E 02	6.895E 03	1.029E 01
2	30.	50.	20.	40.	2.600E 03	8.713E 01	1.743E 03	1.786E 04	1.025E 01
3	50.	80.	30.	65.	1.000E 03	1.438E 02	4.314E 03	4.391E 04	1.018E 01
4	80.	110.	30.	95.	3.300E 02	1.481E 02	4.444E 03	4.472E 04	1.006E 01
5	110.	150.	40.	130.	1.250E 02	1.438E 02	5.752E 03	5.693E 04	9.898E 00
6	150.	200.	50.	175.	2.300E 01	6.454E 01	3.227E 03	3.118E 04	9.661E 00
7	200.	250.	50.	225.	3.000E 00	1.789E 01	8.946E 02	8.398E 03	9.388E 00
8	250.	300.	50.	275.	6.500E-01	7.078E 00	3.539E 02	3.226E 03	9.117E 00
9	300.	350.	50.	325.	2.000E-01	3.595E 00	1.797E 02	1.592E 03	8.856E 00
10	350.	400.	50.	375.	8.000E-02	2.209E 00	1.104E 02	9.508E 02	8.609E 00
11	400.	450.	50.	425.	4.000E-02	1.608E 00	8.039E 01	6.732E 02	8.374E 00
12	450.	500.	50.	475.	2.300E-02	1.291E 00	6.453E 01	5.202E 02	8.154E 00
13	500.	550.	50.	525.	1.600E-02	1.212E 00	6.061E 01	4.810E 02	7.945E 00
14	550.	600.	50.	575.	1.200E-02	1.194E 00	5.972E 01	4.628E 02	7.748E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (μm)
2.195E 04	2.178E 05	8.146E 05	109

TOWER CONDITIONS: V_u = 10.3 m/s ; T_a = 39.5°C ; T_1 = 41.7 °C ; T_0 = °C

Range: °C ; Approach: °C ; Heat Load: ~ MW

AMBIENT CONDITIONS: Wind Speed: 12.1 Km/hr ; Wind Direction: SW ; Twet/Tdry = 24.4/29.2 °C

TURKEY POINT ISOKINETIC SAMPLING SUMMARY FOR DIAMETER SW-NE 3

IK Tube Position	Date	M_{Na} (μg)	M_{Mg} (μg)	V_s (m^3)	$\bar{v}_u$ (m/s)	$\frac{\bar{C}_{Na}}{C_{Na}}$	$\frac{\bar{C}_{Mg}}{C_{Mg}}$	F^a_{Na} ($\mu g/m^2 \cdot s$)	F^a_{Mg} ($\mu g/m^2 \cdot s$)	ΔA (m^2)	Δm^a_{Na} (μg/s)	Δm^a_{Mg} (μg/s)
0.6	7/20/74	554	64	9.3	8.8	0.88	0.88	461	53	3.86	1,779	205
1.6	7/20/74	724	84	12.0	11.7	0.88	0.88	621	72	3.52	2,186	253
2.6	7/20/74	1,044	120	14.4	15.2	0.88	0.88	970	117	3.23	3,133	359
3.6	7/20/74	2,674	298	28.4	14.5	0.88	0.88	1,201	134	3.04	3,651	407
4.6	7/20/74	2,274	203	11.2	12.9	0.88	0.88	2,305	206	2.66	6,131	548
5.6	7/22/74	1,839	210	16.0	11.6	0.92	0.87	1,227	132	2.45	3,006	323
6.6	7/22/74	1,984	225	17.9	8.7	0.92	0.87	887	95	2.08	1,845	198
7.6	7/23/74	1,034	150	15.6	4.8	0.87	0.85	277	39	1.86	515	73
19.6	7/24/74	1,689	175	9.7	7.0	0.99	0.86	1,207	109	1.78	2,148	194
20.6	7/24/74	3,999	430	11.9	9.1	0.99	0.86	3,027	283	2.00	6,054	566
21.6	7/24/74	3,744	423	12.2	10.6	0.99	0.86	3,220	316	2.29	7,374	724
22.6	7/24/74	6,474	720	12.7	12.0	0.99	0.86	6,056	585	2.66	16,110	1,556
										TOTALS:		

TURKEY POINT ISOKINETIC SAMPLING SUMMARY FOR DIAMETER SW-NE 3 CONTINUED

IK Tube Position	Date	M_{Na} (μg)	M_{Mg} (μg)	V_s (m^3)	$\bar{v}_u$ (m/s)	$\frac{\bar{C}_{Na}}{C_{Na}}$	$\frac{\bar{C}_{Mg}}{C_{Mg}}$	F^a_{Na} ($\mu g/m^2 \cdot s$)	F^a_{Mg} ($\mu g/m^2 \cdot s$)	ΔA (m^2)	Δm^a_{Na} ($\mu g/s$)	Δm^a_{Mg} ($\mu g/s$)
23.6	7/23/74	2,411	270	11.8	12.5	0.87	0.85	2,222	243	2.87	6,377	697
24.6	7/23/74	1,574	205	10.5	11.7	0.87	0.85	1,526	194	3.26	4,975	632
25.6	7/23/74	3,499	430	5.7	11.5	0.87	0.85	6,142	737	3.44	21,130	2,535
26.6	7/23/74	6,799	748	12.2	10.8	0.87	0.85	5,236	563	4.83	25,290	2,719
										TOTALS:	111,704	11,989

TOTAL MASS EMISSION RATES ARE: m^a_{Na} =111,704 μg/s and m^a_{Mg} = 11,989 μg/s if the basin water concentration equal the mean concentrations $\bar{C}_{Na}$ and $\bar{C}_{Mg}$ as listed in Table 1 , and if the water flow rate equals 971 kg/s (or 15,400 gpm).

MINERAL MASS EMISSION FRACTIONS: η_{Na} =0.0012 %; η_{Mg} = 0.0012 %; η = 0.0012 %

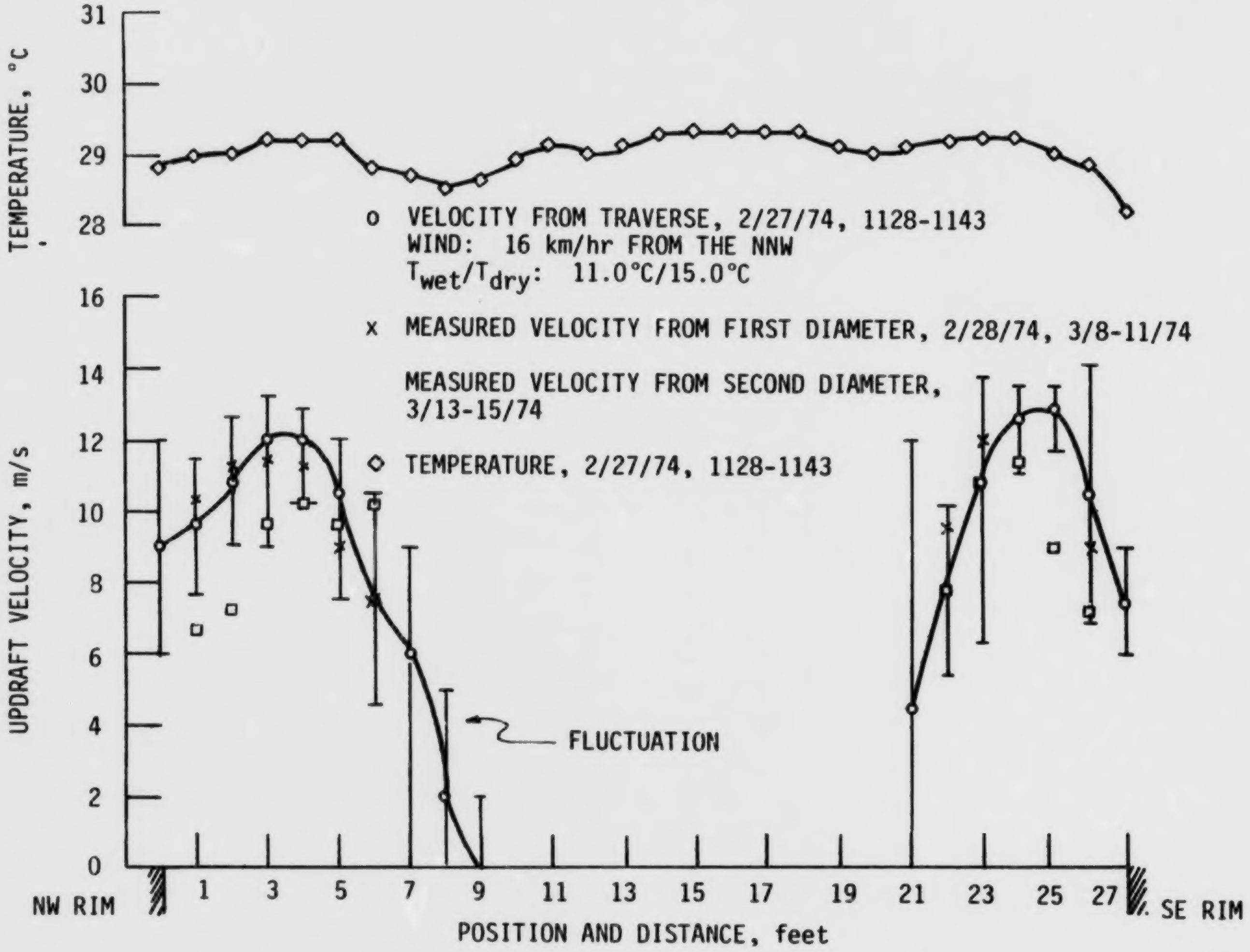

Figure 30. Velocity and temperature profiles, NW-SE diameter.

DIAMETER: NW-SE 1 **POSITION:** 1 **DATE:** 3/8/74 **TIME FRAME:** 1553-1621

NOTE: Concurrent IK Data Point: Position 0.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	6.300E 03	2.639E 01	5.278E 02	5.430E 03	1.029E 01
2	30.	50.	20.	40.	1.000E 03	3.351E 01	6.702E 02	6.871E 03	1.025E 01
3	50.	80.	30.	65.	1.100E 02	1.582E 01	4.745E 02	4.831E 03	1.018E 01
4	80.	110.	30.	95.	1.300E 01	5.836E 00	1.751E 02	1.762E 03	1.006E 01
5	110.	150.	40.	130.	5.000E 00	5.752E 00	2.301E 02	2.277E 03	9.898E 00
6	150.	200.	50.	175.	1.800E 00	5.051E 00	2.526E 02	2.440E 03	9.661E 00
7	200.	250.	50.	225.	3.100E-01	1.849E 00	9.244E 01	8.678E 02	9.388E 00
8	250.	300.	50.	275.	1.300E-01	1.416E 00	7.078E 01	6.453E 02	9.117E 00
9	300.	350.	50.	325.	9.000E-02	1.438E 00	7.190E 01	6.367E 02	8.856E 00
10	350.	400.	50.	375.	5.600E-02	1.546E 00	7.731E 01	6.655E 02	8.609E 00
11	400.	450.	50.	425.	3.500E-02	1.407E 00	7.034E 01	5.891E 02	8.374E 00
12	450.	500.	50.	475.	2.500E-02	1.403E 00	7.014E 01	5.719E 02	8.154E 00
13	500.	550.	50.	525.	1.600E-02	1.212E 00	6.061E 01	4.816E 02	7.945E 00
14	550.	600.	50.	575.	1.300E-02	1.294E 00	6.470E 01	5.013E 02	7.748E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
2.908E 03	2.857E 04	1.034E 05	66

TOWER CONDITIONS: $\overline{V}_u$ = 10.3 m/s ; T_a =33.0 °C ; T_i = 36.2 °C ; T_o = 31.1 °C

Range: 5.1 °C ; Approach: 8.6 °C ; Heat Load: ~26.9 MW

AMBIENT CONDITIONS: Wind Speed: 17.6 Km/hr ; Wind Direction: E ; Twet/Tdry = 22.5/25.7 °C

DIAMETER: NW-SE 1 POSITION: 2 DATE: 3/8/74 TIME FRAME: 1723-1738

NOTE: Concurrent IK Data Point: Position 1.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	7.900E 03	3.309E 01	6.618E 02	7.537E 03	1.139E 01
2	30.	50.	20.	40.	1.300E 03	4.356E 01	8.713E 02	9.891E 03	1.135E 01
3	50.	80.	30.	65.	1.800E 02	2.588E 01	7.765E 02	8.759E 03	1.128E 01
4	80.	110.	30.	95.	2.800E 01	1.257E 01	3.771E 02	4.209E 03	1.116E 01
5	110.	150.	40.	130.	1.400E 01	1.610E 01	6.442E 02	7.085E 03	1.100E 01
6	150.	200.	50.	175.	5.600E 00	1.571E 01	7.857E 02	8.455E 03	1.076E 01
7	200.	250.	50.	225.	1.600E 00	9.543E 00	4.771E 02	5.004E 03	1.049E 01
8	250.	300.	50.	275.	5.600E-01	6.098E 00	3.049E 02	3.115E 03	1.022E 01
9	300.	350.	50.	325.	2.500E-01	4.494E 00	2.247E 02	2.237E 03	9.956E 00
10	350.	400.	50.	375.	1.300E-01	3.590E 00	1.795E 02	1.742E 03	9.709E 00
11	400.	450.	50.	425.	8.000E-02	3.216E 00	1.608E 02	1.523E 03	9.474E 00
12	450.	500.	50.	475.	5.000E-02	2.806E 00	1.403E 02	1.298E 03	9.254E 00
13	500.	550.	50.	525.	2.000E-02	1.515E 00	7.577E 01	6.853E 02	9.045E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
5.680E 03	6.154E 04	2.049E 05	120

TOWER CONDITIONS: $\overline{V}_u$ = 11.4 m/s ; T_a =32.0°C ; T_i =36.5 °C ; T_o = 31.1 °C

Range: 5.4 °C ; Approach: 9.0 °C ; Heat Load: ~28.4 MW

AMBIENT CONDITIONS: Wind Speed: 19.4 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 22.1/25.0 °C

DIAMETER: NW-SE 1 **POSITION:** 3 **DATE:** 3/8/74 **TIME FRAME:** 1843-1943

NOTE: Concurrent IK Data Point: Position 2.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	6.300E 03	2.639E 01	5.278E 02	6.010E 03	1.139E 01
2	30.	50.	20.	40.	1.130E 03	3.787E 01	7.573E 02	8.597E 03	1.135E 01
3	50.	80.	30.	65.	2.000E 02	2.876E 01	8.628E 02	9.732E 03	1.128E 01
4	80.	110.	30.	95.	4.000E 01	1.796E 01	5.387E 02	6.014E 03	1.116E 01
5	110.	150.	40.	130.	1.300E 01	1.495E 01	5.982E 02	6.579E 03	1.100E 01
6	150.	200.	50.	175.	5.000E 00	1.403E 01	7.015E 02	7.549E 03	1.076E 01
7	200.	250.	50.	225.	2.200E 00	1.312E 01	6.561E 02	6.880E 03	1.049E 01
8	250.	300.	50.	275.	8.000E-01	8.711E 00	4.356E 02	4.450E 03	1.022E 01
9	300.	350.	50.	325.	4.500E-01	8.088E 00	4.044E 02	4.026E 03	9.956E 00
10	350.	400.	50.	375.	2.500E-01	6.903E 00	3.451E 02	3.351E 03	9.709E 00
11	400.	450.	50.	425.	1.400E-01	5.627E 00	2.814E 02	2.666E 03	9.474E 00
12	450.	500.	50.	475.	7.000E-02	3.928E 00	1.964E 02	1.817E 03	9.254E 00
13	500.	550.	50.	525.	4.000E-02	3.031E 00	1.515E 02	1.371E 03	9.045E 00
14	550.	600.	50.	575.	2.500E-02	2.489E 00	1.244E 02	1.101E 03	8.848E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
6.581E 03	7.014E 04	2.097E 05	150

TOWER CONDITIONS: $\overline{V}_u$ = 11.4 m/s ; T_a = 32.0°C ; T_i = 36.2°C ; T_o = 31.1°C

Range: 5.1 °C ; Approach: 9.1 °C ; Heat Load: ~ 26.9 MW

AMBIENT CONDITIONS: Wind Speed: 15.9 Km/hr ; Wind Direction: E ; Twet/Tdry = 22.0/24.0 °C

DIAMETER: NW-SE 1 **POSITION:** 4 **DATE:** 3/9/74 **TIME FRAME:** 1057-1155

NOTE: Concurrent IK Data Point: Position 3.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL.X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	7.900E 03	3.309E 01	6.618E 02	7.338E 03	1.109E 01
2	30.	50.	20.	40.	1.000E 03	3.351E 01	6.702E 02	7.407E 03	1.105E 01
3	50.	80.	30.	65.	1.600E 02	2.301E 01	6.902E 02	7.578E 03	1.098E 01
4	80.	110.	30.	95.	3.200E 01	1.437E 01	4.310E 02	4.682E 03	1.086E 01
5	110.	150.	40.	130.	1.000E 01	1.150E 01	4.601E 02	4.923E 03	1.070E 01
6	150.	200.	50.	175.	4.000E 00	1.122E 01	5.612E 02	5.871E 03	1.046E 01
7	200.	250.	50.	225.	2.000E 00	1.193E 01	5.964E 02	6.076E 03	1.019E 01
8	250.	300.	50.	275.	1.000E 00	1.089E 01	5.445E 02	5.399E 03	9.917E 00
9	300.	350.	50.	325.	6.300E-01	1.132E 01	5.662E 02	5.467E 03	9.656E 00
10	350.	400.	50.	375.	3.500E-01	9.664E 00	4.832E 02	4.546E 03	9.409E 00
11	400.	450.	50.	425.	2.500E-01	1.005E 01	5.024E 02	4.610E 03	9.174E 00
12	450.	500.	50.	475.	1.300E-01	7.295E 00	3.647E 02	3.266E 03	8.954E 00
13	500.	550.	50.	525.	7.000E-02	5.304E 00	2.652E 02	2.319E 03	8.745E 00
14	550.	600.	50.	575.	4.000E-02	3.982E 00	1.991E 02	1.702E 03	8.549E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
6.996E 03	7.118E 04	1.958E 05	202

TOWER CONDITIONS: $\overline{V}_u$ = 11.1 m/s ; T_a = 31.0°C ; T_1 = 35.7 °C ; T_o = 31.1 °C

Range: 4.6 °C ; Approach: 8.8 °C ; Heat Load: ~24.2 MW

AMBIENT CONDITIONS: Wind Speed: 20.8 Km/hr ; Wind Direction: SE ; T_{wet}/T_{dry} = 22.3/25.8 °C

DIAMETER: NW-SE 1 **POSITION:** 5 **DATE:** 3/9/74 **TIME FRAME:** 1217-1317

NOTE: Concurrent IK Data Point: Position 4.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	8.900E 03	3.728E 01	7.456E 02	6.701E 03	8.988E 00
2	30.	50.	20.	40.	1.000E 03	3.351E 01	6.702E 02	6.000E 03	8.952E 00
3	50.	80.	30.	65.	1.000E 02	1.438E 01	4.314E 02	3.831E 03	8.880E 00
4	80.	110.	30.	95.	1.400E 01	6.285E 00	1.885E 02	1.652E 03	8.763E 00
5	110.	150.	40.	130.	5.600E 00	6.442E 00	2.577E 02	2.215E 03	8.598E 00
6	150.	200.	50.	175.	2.500E 00	7.015E 00	3.508E 02	2.933E 03	8.361E 00
7	200.	250.	50.	225.	1.000E 00	5.964E 00	2.982E 02	2.412E 03	8.088E 00
8	250.	300.	50.	275.	4.000E-01	4.356E 00	2.178E 02	1.702E 03	7.817E 00
9	300.	350.	50.	325.	1.700E-01	3.056E 00	1.528E 02	1.154E 03	7.556E 00
10	350.	400.	50.	375.	8.300E-02	2.209E 00	1.104E 02	8.072E 02	7.309E 00
11	400.	450.	50.	425.	5.000E-02	2.010E 00	1.005E 02	7.109E 02	7.074E 00
12	450.	500.	50.	475.	3.100E-02	1.740E 00	8.698E 01	5.961E 02	6.854E 00
13	500.	550.	50.	525.	2.000E-02	1.515E 00	7.577E 01	5.035E 02	6.645E 00
14	550.	600.	50.	575.	1.400E-02	1.394E 00	6.968E 01	4.493E 02	6.448E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
3.756E 03	3.167E 04	7.790E 04	85

TOWER CONDITIONS: $\overline{V}_u$ = 9.0 m/s ; T_a = 31.2°C ; T_i = 35.8 °C ; T_o = 31.1 °C

Range: 4.7 °C ; Approach: 9.1 °C ; Heat Load: ~24.8 MW

AMBIENT CONDITIONS: Wind Speed: 20.8 Km/hr ; Wind Direction: SE ; T_{wet}/T_{dry} = 22.0/25.8 °C

DIAMETER: NW-SE 1 **POSITION:** 6 **DATE:** 3/9/74 **TIME FRAME:** 1333-1433

NOTE: Concurrent IK Data Point: Position 5.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	5.000E 03	2.094E 01	4.189E 02	3.136E 03	7.488E 00
2	30.	50.	20.	40.	7.100E 02	2.379E 01	4.758E 02	3.546E 03	7.452E 00
3	50.	80.	30.	65.	6.300E 01	9.059E 00	2.718E 02	2.006E 03	7.380E 00
4	80.	110.	30.	95.	1.100E 01	4.938E 00	1.481E 02	1.076E 03	7.263E 00
5	110.	150.	40.	130.	3.500E 00	4.026E 00	1.610E 02	1.143E 03	7.098E 00
6	150.	200.	50.	175.	1.300E 00	3.648E 00	1.824E 02	1.252E 03	6.861E 00
7	200.	250.	50.	225.	5.000E-01	2.982E 00	1.491E 02	9.822E 02	6.588E 00
8	250.	300.	50.	275.	2.000E-01	2.178E 00	1.089E 02	6.879E 02	6.317E 00
9	300.	350.	50.	325.	1.000E-01	1.797E 00	8.987E 01	5.443E 02	6.056E 00
10	350.	400.	50.	375.	5.000E-02	1.381E 00	6.903E 01	4.010E 02	5.809E 00
11	400.	450.	50.	425.	2.800E-02	1.125E 00	5.627E 01	3.137E 02	5.574E 00
12	450.	500.	50.	475.	1.600E-02	8.978E-01	4.489E 01	2.403E 02	5.354E 00
13	500.	550.	50.	525.	9.000E-03	6.819E-01	3.409E 01	1.754E 02	5.145E 00
14	550.	600.	50.	575.	5.000E-03	4.977E-01	2.489E 01	1.231E 02	4.948E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
2.235E 03	1.563E 04	3.375E 04	75

TOWER CONDITIONS: $\overline{V}_u$ = 7.5 m/s ; T_a = 31.1°C ; T_1 = 35.8 °C ; T_0 = 31.1 °C

Range: 4.7 °C ; Approach: 8.6 °C ; Heat Load: ~24.8 MW

AMBIENT CONDITIONS: Wind Speed: 20.8 Km/hr ; Wind Direction: SE ; Twet/Tdry = 22.5/25.7 °C

DIAMETER: NW-SE 1 **POSITION:** 22 **DATE:** 2/28/74 **TIME FRAME:** 1401-1501

NOTE: Concurrent IK Data Point: Position 21.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	7.100E 03	2.974E 01	5.948E 02	5.703E 03	9.588E 00
2	30.	50.	20.	40.	1.000E 03	3.351E 01	6.702E 02	6.402E 03	9.552E 00
3	50.	80.	30.	65.	1.300E 02	1.869E 01	5.608E 02	5.316E 03	9.480E 00
4	80.	110.	30.	95.	2.000E 01	8.978E 00	2.694E 02	2.522E 03	9.363E 00
5	110.	150.	40.	130.	5.000E 00	5.752E 00	2.301E 02	2.116E 03	9.198E 00
6	150.	200.	50.	175.	1.100E 00	3.087E 00	1.543E 02	1.383E 03	8.961E 00
7	200.	250.	50.	225.	2.800E-01	1.670E 00	8.350E 01	7.254E 02	8.688E 00
8	250.	300.	50.	275.	1.000E-01	1.089E 00	5.445E 01	4.583E 02	8.417E 00
9	300.	350.	50.	325.	5.000E-02	8.987E-01	4.494E 01	3.665E 02	8.156E 00
10	350.	400.	50.	375.	3.100E-02	8.560E-01	4.280E 01	3.385E 02	7.909E 00
11	400.	450.	50.	425.	2.000E-02	8.039E-01	4.019E 01	3.085E 02	7.674E 00
12	450.	500.	50.	475.	1.300E-02	7.295E-01	3.647E 01	2.719E 02	7.454E 00
13	500.	550.	50.	525.	8.000E-03	6.061E-01	3.031E 01	2.196E 02	7.245E 00
14	550.	600.	50.	575.	6.000E-03	5.972E-01	2.986E 01	2.105E 02	7.048E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
2.842E 03	2.634E 04	6.612E 04	58

TOWER CONDITIONS: $\overline{V}_u$ = 9.6 m/s ; T_a = 24.6°C ; T_i = 26.9 °C ; T_o = 23.6 °C

Range: 3.3 °C ; Approach: 8.1 °C ; Heat Load: ~17.4 MW

AMBIENT CONDITIONS: Wind Speed: 14.1 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 15.5/21.2 °C

DIAMETER: NW-SE 1 **POSITION:** 23 **DATE:** 2/28/74 **TIME FRAME:** 1533-1635

NOTE: Concurrent IK Data Point: Position 22.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	6.300E 03	2.639E 01	5.278E 02	6.327E 03	1.199E 01
2	30.	50.	20.	40.	1.000E 03	3.351E 01	6.702E 02	8.010E 03	1.195E 01
3	50.	80.	30.	65.	2.000E 02	2.876E 01	8.628E 02	1.025E 04	1.188E 01
4	80.	110.	30.	95.	3.500E 01	1.571E 01	4.714E 02	5.545E 03	1.176E 01
5	110.	150.	40.	130.	6.300E 00	7.247E 00	2.899E 02	3.362E 03	1.160E 01
6	150.	200.	50.	175.	1.000E 00	2.806E 00	1.403E 02	1.594E 03	1.136E 01
7	200.	250.	50.	225.	2.800E-01	1.670E 00	8.350E 01	9.258E 02	1.109E 01
8	250.	300.	50.	275.	1.000E-01	1.089E 00	5.445E 01	5.889E 02	1.082E 01
9	300.	350.	50.	325.	6.300E-02	1.132E 00	5.662E 01	5.977E 02	1.056E 01
10	350.	400.	50.	375.	3.500E-02	9.664E-01	4.832E 01	4.981E 02	1.031E 01
11	400.	450.	50.	425.	2.500E-02	1.005E 00	5.024E 01	5.062E 02	1.007E 01
12	450.	500.	50.	475.	1.400E-02	7.856E-01	3.928E 01	3.871E 02	9.854E 00
13	500.	550.	50.	525.	1.000E-03	7.577E-02	3.788E 00	3.654E 01	9.645E 00
14	550.	600.	50.	575.	8.000E-03	7.963E-01	3.982E 01	3.762E 02	9.448E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
3.338E 03	3.900E 04	1.096E 05	66

TOWER CONDITIONS: $\overline{V}_u$ = 12.0 m/s ; T_a = 24.8°C ; T_i = 27.2 °C ; T_o = 23.6 °C

Range: 3.6 °C ; Approach: 8.0 °C ; Heat Load: ~19.0 MW

AMBIENT CONDITIONS: Wind Speed: 11.2 Km/hr ; Wind Direction: E ; Twet/Tdry = 15.6/22.0 °C

DIAMETER: NW-SE 1 **POSITION:** 24 **DATE:** 2/28/74 **TIME FRAME:** 1656-1756

NOTE· Concurrent IK Data Point: Position 23.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	5.600E 03	2.346E 01	4.691E 02	5.905E 03	1.259E 01
2	30.	50.	20.	40.	1.300E 03	4.356E 01	8.713E 02	1.094E 04	1.255E 01
3	50.	80.	30.	65.	2.500E 02	3.595E 01	1.078E 03	1.346E 04	1.248E 01
4	80.	110.	30.	95.	5.000E 01	2.245E 01	6.734E 02	8.325E 03	1.236E 01
5	110.	150.	40.	130.	6.900E 00	1.024E 01	4.095E 02	4.995E 03	1.220E 01
6	150.	200.	50.	175.	2.200E 00	6.174E 00	3.087E 02	3.692E 03	1.196E 01
7	200.	250.	50.	225.	6.300E-01	3.757E 00	1.879E 02	2.196E 03	1.169E 01
8	250.	300.	50.	275.	2.200E-01	2.396E 00	1.198E 02	1.368E 03	1.142E 01
9	300.	350.	50.	325.	8.900E-02	1.600E 00	7.999E 01	8.923E 02	1.116E 01
10	350.	400.	50.	375.	4.400E-02	1.215E 00	6.075E 01	6.626E 02	1.091E 01
11	400.	450.	50.	425.	3.100E-02	1.246E 00	6.230E 01	6.650E 02	1.067E 01
12	450.	500.	50.	475.	2.200E-02	1.235E 00	6.173E 01	6.453E 02	1.045E 01
13	500.	550.	50.	525.	1.600E-02	1.212E 00	6.061E 01	6.210E 02	1.025E 01
14	550.	600.	50.	575.	1.100E-02	1.095E 00	5.475E 01	5.501E 02	1.005E 01

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
4.498E 03	5.491E 04	1.669E 05	75

TOWER CONDITIONS: $\overline{V}_u$ = 12.6 m/s ; T_a =25.5°C ; T_i =27.5 °C ; T_o =23.6 °C

Range: 3.9 °C ; Approach: 8.3 °C ; Heat Load: ~20.6 MW

AMBIENT CONDITIONS: Wind Speed: 9.3 Km/hr ; Wind Direction: E ; Twet/Tdry = 15.3/21.4 °C

DIAMETER: NW-SE 1 **POSITION:** 25 **DATE:** 2/28/74 **TIME FRAME:** 1240-1340

NOTE: Concurrent IK Data Point: Position 24.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	4.000E 03	1.676E 01	3.351E 02	4.319E 03	1.289E 01
2	30.	50.	20.	40.	7.900E 02	2.647E 01	5.295E 02	6.805E 03	1.285E 01
3	50.	80.	30.	65.	1.400E 02	2.013E 01	6.039E 02	7.718E 03	1.278E 01
4	80.	110.	30.	95.	1.600E 01	7.183E 00	2.155E 02	2.729E 03	1.266E 01
5	110.	150.	40.	130.	2.000E 00	2.301E 00	9.203E 01	1.150E 03	1.250E 01
6	150.	200.	50.	175.	3.500E-01	9.822E-01	4.911E 01	6.021E 02	1.226E 01
7	200.	250.	50.	225.	1.100E-01	6.561E-01	3.280E 01	3.932E 02	1.199E 01
8	250.	300.	50.	275.	6.300E-02	6.860E-01	3.430E 01	4.019E 02	1.172E 01
9	300.	350.	50.	325.	4.000E-02	7.190E-01	3.595E 01	4.118E 02	1.146E 01
10	350.	400.	50.	375.	2.800E-02	7.731E-01	3.866E 01	4.333E 02	1.121E 01
11	400.	450.	50.	425.	1.800E-02	7.235E-01	3.618E 01	3.970E 02	1.097E 01
12	450.	500.	50.	475.	1.100E-02	6.173E-01	3.086E 01	3.319E 02	1.075E 01
13	500.	550.	50.	525.	8.000E-03	6.061E-01	3.031E 01	3.196E 02	1.055E 01
14	550.	600.	50.	575.	6.300E-03	6.271E-01	3.136E 01	3.245E 02	1.035E 01

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
2.096E 03	2.634E 04	9.059E 04	59

TOWER CONDITIONS: $\overline{V}_u$ = 12.9 m/s ; T_a = 25.0°C ; T_i = 26.8 °C ; T_o = 23.6 °C

Range: 3.2 °C ; Approach: 7.8 °C ; Heat Load: ~16.9 MW

AMBIENT CONDITIONS: Wind Speed: 16.1 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 15.8/21.0 °C

DIAMETER: NW-SE 1 **POSITION:** 26 **DATE:** 2/28/74 **TIME FRAME:** 1120-1220

NOTE: Concurrent IK Data Point: Position 25.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	4.000E 03	1.676E 01	3.351E 02	3.012E 03	8.988E 00
2	30.	50.	20.	40.	6.300E 02	2.111E 01	4.222E 02	3.780E 03	8.952E 00
3	50.	80.	30.	65.	8.900E 01	1.280E 01	3.839E 02	3.409E 03	8.880E 00
4	80.	110.	30.	95.	1.300E 01	5.836E 00	1.751E 02	1.534E 03	8.763E 00
5	110.	150.	40.	130.	2.200E 00	2.531E 00	1.012E 02	8.704E 02	8.598E 00
6	150.	200.	50.	175.	4.500E-01	1.263E 00	6.314E 01	5.279E 02	8.361E 00
7	200.	250.	50.	225.	1.000E-01	5.964E-01	2.982E 01	2.412E 02	8.088E 00
8	250.	300.	50.	275.	3.200E-02	3.485E-01	1.742E 01	1.362E 02	7.817E 00
9	300.	350.	50.	325.	1.300E-02	2.337E-01	1.168E 01	8.828E 01	7.556E 00
10	350.	400.	50.	375.	8.000E-03	2.209E-01	1.104E 01	8.072E 01	7.309E 00
11	400.	450.	50.	425.	5.000E-03	2.010E-01	1.005E 01	7.109E 01	7.074E 00
12	450.	500.	50.	475.	3.100E-03	1.740E-01	8.698E 00	5.961E 01	6.854E 00
13	500.	550.	50.	525.	2.500E-03	1.894E-01	9.471E 00	6.294E 01	6.645E 00
14	550.	600.	50.	575.	2.000E-03	1.991E-01	9.954E 00	6.419E 01	6.448E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
1.589E 03	1.394E 04	5.045E 04	53

TOWER CONDITIONS: $\overline{V}_u$ = 9.0 m/s ; T_a =24.5 °C ; T_i = 26.8 °C ; T_o = 23.3 °C

Range: 3.5 °C ; Approach: 7.8 °C ; Heat Load: ~ 18.5 MW

AMBIENT CONDITIONS: Wind Speed: 11.0 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 15.5/20.3 °C

TURKEY POINT ISOKINETIC SAMPLING SUMMARY FOR DIAMETER NW-SE 1

IK Tube Position	Date	M_{Na} (μg)	M_{Mg} (μg)	V_s (m^3)	$\bar{v}_u$ (m/s)	$\frac{\bar{C}_{Na}}{C_{Na}}$	$\frac{\bar{C}_{Mg}}{C_{Mg}}$	F^a_{Na} ($\mu g/m^2 \cdot s$)	F^a_{Mg} ($\mu g/m^2 \cdot s$)	ΔA (m^2)	Δm^a_{Na} ($\mu g/s$)	Δm^a_{Mg} ($\mu g/s$)
0.3	3/08/74	1,939	210	20.0	7.8	0.82	0.89	620	73	4.47	2,771	326
1.3	3/08/74	2,239	240	22.2	10.4	0.82	0.89	860	100	3.52	3,027	352
2.3	3/08/74	3,539	383	18.6	11.8	0.82	0.89	1,841	216	3.28	6,038	708
3.3	3/09/74	3,589	413	17.1	11.9	0.89	0.91	2,223	262	2.93	6,513	768
4.3	3/09/74	3,209	363	17.0	10.5	0.89	0.91	1,764	204	2.60	4,586	530
5.3	3/09/74	2,599	287	15.2	8.45	0.89	0.91	1,286	145	2.35	3,022	341
21.3	2/28/74	3,178	362	17.98	7.3	1.27	1.29	1,639	190	2.32	3,802	441
22.3	2/28/74	4,183	460	22.81	10.6	1.27	1.29	2,469	276	2.61	6,444	720
23.3	2/28/74	3,598	422	22.95	12.4	1.27	1.29	2,469	294	2.9	7,160	853
24.3	2/28/74	3,473	380	20.49	12.4	1.27	1.29	2,669	297	3.20	8,540	950
25.3	2/28/74	2,748	308	15.98	10.4	1.27	1.29	2,271	259	3.49	7,926	904
										TOTALS:	59,829	6,893

TOTAL MASS EMISSION RATES ARE: m^a_{Na} = 59,829 $\mu g/s$ and m^a_{Mg} = 6,893 $\mu g/s$ if the basin water concentration equal the mean concentrations $\bar{C}_{Na}$ and $\bar{C}_{Mg}$ as listed in Table 1 , and if the water flow rate equals 1,272 kg/s (or 20,000 gpm).

MINERAL MASS EMISSION FRACTIONS: η_{Na} = 0.00049 %; η_{Mg} = 0.00052 %; η = 0.000505%

TURKEY POINT ISOKINETIC DATA EXTENSION FOR DIAMETER NW-SE 1

Position	ϕ^a_{Na} ($\mu g/m^3$)	ϕ^a_{Mg} ($\mu g/m^3$)	$\bar{v}_u$ (m/s)	F^a_{Na} ($\mu g/m^2 \cdot s$)	F^a_{Mg} ($\mu g/m^2 \cdot s$)	ΔA (m^2)	Δm^a_{Na} ($\mu g/s$)	Δm^a_{Mg} ($\mu g/s$)
6.3	152	17.2	6.8	1034	117	2.06	2130	241
7.3	152	17.2	4.15	631	71.4	1.77	1117	126
8.3	152	17.2	1.65	251	28.4	1.48	371	42.0
19.3	225	26.0	0.55	124	14.3	1.71	212	24.5
20.3	225	26.0	3.5	788	91.0	2.03	1600	185
26.3	218	24.9	8.3	1809	207	4.95	8955	1025
						TOTALS:	14,385	1,644

UPPER LIMIT OF MINERAL MASS EMISSION FRACTIONS:

$\eta'_{Na} = 0.00060\%$ $\eta'_{Mg} = 0.00064\%$ $\eta' = 0.00062\%$

DIAMETER: NW-SE 2 **POSITION:** 1 **DATE:** 3/13/74 **TIME FRAME:** 1218-1318

NOTE: Concurrent IK Data Point: Position 0.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.250E 04	5.236E 01	1.047E 03	6.898E 03	6.588E 00
2	30.	50.	20.	40.	2.000E 03	6.702E 01	1.340E 03	8.782E 03	6.552E 00
3	50.	80.	30.	65.	2.000E 02	2.876E 01	8.628E 02	5.591E 03	6.480E 00
4	80.	110.	30.	95.	1.600E 01	7.183E 00	2.155E 02	1.371E 03	6.363E 00
5	110.	150.	40.	130.	4.500E 00	5.177E 00	2.071E 02	1.283E 03	6.198E 00
6	150.	200.	50.	175.	1.100E 00	3.087E 00	1.543E 02	9.201E 02	5.961E 00
7	200.	250.	50.	225.	2.000E-01	1.193E 00	5.964E 01	3.392E 02	5.688E 00
8	250.	300.	50.	275.	6.300E-02	6.860E-01	3.430E 01	1.858E 02	5.417E 00
9	300.	350.	50.	325.	2.800E-02	5.033E-01	2.516E 01	1.298E 02	5.156E 00
10	350.	400.	50.	375.	1.800E-02	4.970E-01	2.485E 01	1.220E 02	4.909E 00
11	400.	450.	50.	425.	1.100E-02	4.421E-01	2.211E 01	1.033E 02	4.674E 00
12	450.	500.	50.	475.	7.900E-03	4.433E-01	2.217E 01	9.872E 01	4.454E 00
13	500.	550.	50.	525.	5.600E-03	4.243E-01	2.121E 01	9.006E 01	4.245E 00
14	550.	600.	50.	575.	4.000E-03	3.982E-01	1.991E 01	8.059E 01	4.048E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
4.057E 03	2.600E 04	9.592E 04	45

TOWER CONDITIONS: $\overline{V}_u$ = 6.6 m/s ; T_a = 30.5°C ; T_1 = 33.3 °C ; T_o = 28.6 °C

Range: 4.7 °C ; Approach: 7.9 °C ; Heat Load: ~24.8 MW

AMBIENT CONDITIONS: Wind Speed: 16.1 Km/hr ; Wind Direction: N-NW ; Twet/Tdry = 20.7/25.8 °C

DIAMETER: NW-SE 2 **POSITION:** 2 **DATE:** 3/13/74 **TIME FRAME:** 1357-1457

NOTE: Concurrent IK Data Point: Position 1.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	8.900E 03	3.728E 01	7.456E 02	5.359E 03	7.188E 00
2	30.	50.	20.	40.	1.400E 03	4.691E 01	9.383E 02	6.711E 03	7.152E 00
3	50.	80.	30.	65.	1.400E 02	2.013E 01	6.039E 02	4.276E 03	7.080E 00
4	90.	110.	30.	95.	3.200E 01	1.437E 01	4.310E 02	3.001E 03	6.963E 00
5	110.	150.	40.	130.	1.300E 01	1.495E 01	5.982E 02	4.066E 03	6.798E 00
6	150.	200.	50.	175.	5.000E 00	1.403E 01	7.015E 02	4.603E 03	6.561E 00
7	200.	250.	50.	225.	1.300E 00	7.753E 00	3.877E 02	2.438E 03	6.288E 00
8	250.	300.	50.	275.	3.500E-01	3.811E 00	1.906E 02	1.147E 03	6.017E 00
9	300.	350.	50.	325.	1.800E-01	3.235E 00	1.618E 02	9.312E 02	5.756E 00
10	350.	400.	50.	375.	8.900E-02	2.457E 00	1.229E 02	6.768E 02	5.509E 00
11	400.	450.	50.	425.	3.500E-02	1.407E 00	7.034E 01	3.710E 02	5.274E 00
12	450.	500.	50.	475.	1.600E-02	8.976E-01	4.489E 01	2.269E 02	5.054E 00
13	500.	550.	50.	525.	7.900 E-03	5.988 E-01	2.994 E 01	1.451 E 02	4.845 E 00
14	550.	600.	50.	575.	4.500 E-03	4.478 E-01	2.234 E 01	1.041 E 02	4.640 E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (μm)
5.049E 03	3.405E 04	1.168E 05	95

TOWER CONDITIONS: $\overline{V}_u$ = 7.2 m/s ; T_a = 30.2°C ; T_i = 33.2 °C ; T_o = 28.6 °C

Range: 4.6 °C ; Approach: 7.8 °C ; Heat Load: ~24.3 MW

AMBIENT CONDITIONS: Wind Speed: 12.3 Km/hr ; Wind Direction: N-NW ; T_{wet}/T_{dry} = 20.8/27.8 °C

DIAMETER: NW-SE 2 **POSITION:** 3 **DATE:** 3/13/74 **TIME FRAME:** 1519-1545

NOTE: Concurrent IK Data Point: Position 2.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(LEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.100E 04	4.608E 01	9.215E 02	8.835E 03	9.588E 00
2	30.	50.	20.	40.	2.000E 03	6.702E 01	1.340E 03	1.280E 04	9.552E 00
3	50.	80.	30.	65.	4.000E 02	5.752E 01	1.726E 03	1.636E 04	9.480E 00
4	80.	110.	30.	95.	7.900E 01	3.546E 01	1.064E 03	9.962E 03	9.363E 00
5	110.	150.	40.	130.	2.800E 01	3.221E 01	1.288E 03	1.185E 04	9.198E 00
6	150.	200.	50.	175.	8.900E 00	2.497E 01	1.249E 03	1.119E 04	8.961E 00
7	200.	250.	50.	225.	2.800E 00	1.670E 01	8.350E 02	7.254E 03	8.688E 00
8	250.	300.	50.	275.	1.500E 00	1.742E 01	8.711E 02	7.332E 03	8.417E 00
9	300.	350.	50.	325.	8.900E-01	1.600E 01	7.999E 02	6.524E 03	8.156E 00
10	350.	400.	50.	375.	5.000E-01	1.381E 01	6.903E 02	5.459E 03	7.909E 00
11	400.	450.	50.	425.	2.800E-01	1.125E 01	5.627E 02	4.319E 03	7.674E 00
12	450.	500.	50.	475.	1.400E-01	7.856E 00	3.928E 02	2.928E 03	7.454E 00
13	500.	550.	50.	525.	7.900E-02	5.986E 00	2.993E 02	2.168E 03	7.245E 00
14	550.	600.	50.	575.	4.500E-02	4.479E 00	2.240E 02	1.579E 03	7.048E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
1.226E 04	1.086E 05	3.409E 05	144

TOWER CONDITIONS: $\overline{V}_u$ = 9.6 m/s ; T_a =30.1°C ; T_i =33.2 °C ; T_o = 28.9 °C

Range: 4.3 °C ; Approach: 7.0 °C ; Heat Load: ~22.7 MW

AMBIENT CONDITIONS: Wind Speed: 7.8 Km/hr ; Wind Direction: N-NW ; Twet/Tdry = 21.9/26.1 °C

DIAMETER: NW-SE 2 **POSITION:** 4 **DATE:** 3/13/74 **TIME FRAME:** 1641-1741

NOTE: Concurrent IK Data Point: Position 3.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.000E 04	4.189E 01	8.378E 02	8.535E 03	1.019E 01
2	30.	50.	20.	40.	1.600E 03	5.362E 01	1.072E 03	1.089E 04	1.015E 01
3	50.	80.	30.	65.	3.200E 02	4.601E 01	1.380E 03	1.391E 04	1.008E 01
4	80.	110.	30.	95.	5.600E 01	2.514E 01	7.542E 02	7.514E 03	9.963E 00
5	110.	150.	40.	130.	1.800E 01	2.071E 01	8.283E 02	8.115E 03	9.798E 00
6	150.	200.	50.	175.	5.000E 00	1.403E 01	7.015E 02	6.708E 03	9.561E 00
7	200.	250.	50.	225.	2.500E 00	1.491E 01	7.455E 02	6.924E 03	9.288E 00
8	250.	300.	50.	275.	1.400E 00	1.524E 01	7.622E 02	6.873E 03	9.017E 00
9	300.	350.	50.	325.	7.100E-01	1.276E 01	6.381E 02	5.587E 03	8.756E 00
10	350.	400.	50.	375.	3.200E-01	8.836E 00	4.418E 02	3.759E 03	8.509E 00
11	400.	450.	50.	425.	1.100E-01	4.421E 00	2.211E 02	1.829E 03	8.274E 00
12	450.	500.	50.	475.	4.500E-02	2.525E 00	1.263E 02	1.017E 03	8.054E 00
13	500.	550.	50.	525.	2.000E-02	1.515E 00	7.577E 01	5.944E 02	7.845E 00
14	550.	600.	50.	575.	1.000E-02	9.954E-01	4.977E 01	3.807E 02	7.648E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
8.635E 03	8.264E 04	2.347E 05	123

TOWER CONDITIONS: $\overline{V}_u$ = 10.2 m/s ; T_a = 30.3°C ; T_i = 33.0 °C ; T_o = 29.2 °C

Range: 3.8 °C ; Approach: 6.8 °C ; Heat Load: ~20.1 MW

AMBIENT CONDITIONS: Wind Speed: 8.0 Km/hr ; Wind Direction: N-NW ; T_{wet}/T_{dry} = 22.4/26.2 °C

DIAMETER: NW-SE 2 **POSITION:** 5 **DATE:** 3/13/74 **TIME FRAME:** 1822-1922

NOTE: Concurrent IK Data Point: Position 4.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.100E 04	4.608E 01	9.215E 02	8.835E 03	9.588E 00
2	30.	50.	20.	40.	1.600E 03	5.362E 01	1.072E 03	1.024E 04	9.552E 00
3	50.	80.	30.	65.	1.600E 02	2.301E 01	6.902E 02	6.543E 03	9.480E 00
4	80.	110.	30.	95.	2.800E 01	1.257E 01	3.771E 02	3.531E 03	9.363E 00
5	110.	150.	40.	130.	7.100E 00	8.167E 00	3.267E 02	3.005E 03	9.198E 00
6	150.	200.	50.	175.	3.200E 00	8.980E 00	4.490E 02	4.023E 03	8.961E 00
7	200.	250.	50.	225.	1.400E 00	8.350E 00	4.175E 02	3.627E 03	8.688E 00
8	250.	300.	50.	275.	4.000E-01	4.356E 00	2.178E 02	1.833E 03	8.417E 00
9	300.	350.	50.	325.	1.300E-01	2.337E 00	1.168E 02	9.529E 02	8.156E 00
10	350.	400.	50.	375.	5.600E-02	1.546E 00	7.731E 01	6.114E 02	7.909E 00
11	400.	450.	50.	425.	3.200E-02	1.286E 00	6.431E 01	4.936E 02	7.674E 00
12	450.	500.	50.	475.	2.000E-02	1.122E 00	5.612E 01	4.183E 02	7.454E 00
13	500.	550.	50.	525.	1.300E-02	9.850E-01	4.925E 01	3.568E 02	7.245E 00
14	550.	600.	50.	575.	8.900E-03	8.859E-01	4.430E 01	3.122E 02	7.048E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
4.880E 03	4.479E 04	1.142E 05	69

TOWER CONDITIONS: $\overline{V}_u$ = 9.6 m/s ; T_a = 30.3°C ; T_1 = 34.2 °C ; T_0 = 29.2 °C

Range: 5.0 °C ; Approach: 9.7 °C ; Heat Load: ~26.4 MW

AMBIENT CONDITIONS: Wind Speed: 8.0 Km/hr ; Wind Direction: N-NW ; Twet/Tdry = 21.5/25.1 °C

DIAMETER: NW-SE 2 **POSITION:** 6 **DATE:** 3/14/74 **TIME FRAME:** 1111-1140

NOTE: Concurrent IK Data Point: Position 5.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.000E 04	4.189E 01	8.378E 02	8.535E 03	1.019E 01
2	30.	50.	20.	40.	1.300E 03	4.356E 01	8.713E 02	8.845E 03	1.015E 01
3	50.	80.	30.	65.	7.900E 01	1.136E 01	3.408E 02	3.435E 03	1.008E 01
4	80.	110.	30.	95.	1.000E 01	4.489E 00	1.347E 02	1.342E 03	9.963E 00
5	110.	150.	40.	130.	3.500E 00	4.026E 00	1.610E 02	1.578E 03	9.798E 00
6	150.	200.	50.	175.	1.400E 00	3.929E 00	1.964E 02	1.878E 03	9.561E 00
7	200.	250.	50.	225.	5.600E-01	3.340E 00	1.670E 02	1.551E 03	9.288E 00
8	250.	300.	50.	275.	2.200E-01	2.396E 00	1.198E 02	1.080E 03	9.017E 00
9	300.	350.	50.	325.	1.000E-01	1.797E 00	8.987E 01	7.869E 02	8.756E 00
10	350.	400.	50.	375.	3.500E-02	9.664E-01	4.832E 01	4.111E 02	8.509E 00
11	400.	450.	50.	425.	1.600E-02	6.431E-01	3.216E 01	2.661E 02	8.274E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
2.999E 03	2.971E 04	6.595E 04	45

TOWER CONDITIONS: $\overline{V}_u$ = 10.2 m/s ; T_a = 30.2°C ; T_i = 34.2 °C ; T_o = 29.2 °C

Range: 5.0 °C ; Approach: 9.7 °C ; Heat Load: ~26.4 MW

AMBIENT CONDITIONS: Wind Speed: 2.5 Km/hr ; Wind Direction: NE ; Twet/Tdry = 19.5/22.8 °C

DIAMETER: NW-SE 2 **POSITION:** 20 **DATE:** 3/14/74 **TIME FRAME:** 1258-1358

NOTE: Concurrent IK Data Point: Position 19.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	7.900E 03	3.309E 01	6.618E 02	2.374E 03	3.588E 00
2	30.	50.	20.	40.	1.000E 03	3.351E 01	6.702E 02	2.381E 03	3.552E 00
3	50.	80.	30.	65.	2.800E 01	4.026E 00	1.208E 02	4.203E 02	3.480E 00
4	80.	110.	30.	95.	4.500E 00	2.020E 00	6.060E 01	2.038E 02	3.363E 00
5	110.	150.	40.	130.	1.300E 00	1.495E 00	5.982E 01	1.913E 02	3.198E 00
6	150.	200.	50.	175.	3.200E-01	8.980E-01	4.490E 01	1.330E 02	2.961E 00
7	200.	250.	50.	225.	1.100E-01	6.561E-01	3.280E 01	8.816E 01	2.688E 00
8	250.	300.	50.	275.	4.500E-02	4.900E-01	2.450E 01	5.922E 01	2.417E 00
9	300.	350.	50.	325.	2.200E-02	3.954E-01	1.977E 01	4.263E 01	2.156E 00
10	350.	400.	50.	375.	1.300E-02	3.590E-01	1.795E 01	3.425E 01	1.909E 00
11	400.	450.	50.	425.	8.900E-03	3.577E-01	1.789E 01	2.995E 01	1.674E 00
12	450.	500.	50.	475.	6.300E-03	3.535E-01	1.768E 01	2.570E 01	1.454E 00
13	500.	550.	50.	525.	4.000E-03	3.031E-01	1.515E 01	1.887E 01	1.245E 00
14	550.	600.	50.	575.	2.800E-03	2.787E-01	1.394E 01	1.461E 01	1.048E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
1.778E 03	6.017E 03	1.101E 04	37

TOWER CONDITIONS: $\overline{V}_u$ = 3.6 m/s ; T_a = 30.1°C ; T_i = 34.0 °C ; T_o = 29.2 °C

Range: 4.8 °C ; Approach: 8.4 °C ; Heat Load: ~25.3 MW

AMBIENT CONDITIONS: Wind Speed: 8.5 Km/hr ; Wind Direction: NE ; Twet/Tdry = 20.8/25.0 °C

DIAMETER: NW-SE 2 **POSITION:** 21 **DATE:** 3/14/74 **TIME FRAME:** 1830-1915

NOTE: Concurrent IK Data Point: Position 20.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	7.900E 03	3.309E 01	6.618E 02	4.360E 03	6.588E 00
2	30.	50.	20.	40.	1.600E 03	5.362E 01	1.072E 03	7.026E 03	6.552E 00
3	50.	80.	30.	65.	1.400E 02	2.013E 01	6.039E 02	3.913E 03	6.480E 00
4	80.	110.	30.	95.	1.400E 01	6.285E 00	1.885E 02	1.200E 03	6.363E 00
5	110.	150.	40.	130.	4.000E 00	4.601E 00	1.841E 02	1.141E 03	6.198E 00
6	150.	200.	50.	175.	2.000E 00	5.612E 00	2.806E 02	1.673E 03	5.961E 00
7	200.	250.	50.	225.	1.000E 00	5.964E 00	2.982E 02	1.696E 03	5.688E 00
8	250.	300.	50.	275.	5.000E-01	5.445E 00	2.722E 02	1.475E 03	5.417E 00
9	300.	350.	50.	325.	2.000E-01	3.595E 00	1.797E 02	9.268E 02	5.156E 00
10	350.	400.	50.	375.	1.300E-01	3.590E 00	1.795E 02	8.810E 02	4.909E 00
11	400.	450.	50.	425.	7.900E-02	3.175E 00	1.588E 02	7.422E 02	4.674E 00
12	450.	500.	50.	475.	5.600E-02	3.142E 00	1.571E 02	6.998E 02	4.454E 00
13	500.	550.	50.	525.	4.000E-02	3.031E 00	1.515E 02	6.433E 02	4.245E 00
14	550.	600.	50.	575.	2.800E-02	2.787E 00	1.394E 02	5.641E 02	4.048E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
4.528E 03	2.694E 04	5.711E 04	76

TOWER CONDITIONS: $\overline{V}_u$ = 6.6 m/s ; T_a = 30.5°C ; T_i = 33.2 °C ; T_o = 28.9 °C

Range: 4.3 °C ; Approach: 9.6 °C ; Heat Load: ~22.7 MW

AMBIENT CONDITIONS: Wind Speed: 15.9 Km/hr ; Wind Direction: NE ; Twet/Tdry = 19.3/22.8 °C

DIAMETER: NW-SE 2 **POSITION:** 22 **DATE:** 3/15/74 **TIME FRAME:** 1300-1400

NOTE: Concurrent IK Data Point: Position 21.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.000E 04	4.189E 01	8.378E 02	6.524E 03	7.788E 00
2	30.	50.	20.	40.	2.000E 03	6.702E 01	1.340E 03	1.039E 04	7.752E 00
3	50.	80.	30.	65.	1.400E 02	2.013E 01	6.039E 02	4.638E 03	7.680E 00
4	80.	110.	30.	95.	1.100E 01	4.938E 00	1.481E 02	1.120E 03	7.563E 00
5	110.	150.	40.	130.	2.800E 00	3.221E 00	1.288E 02	9.531E 02	7.398E 00
6	150.	200.	50.	175.	8.900E-01	2.497E 00	1.249E 02	8.943E 02	7.161E 00
7	200.	250.	50.	225.	3.500E-01	2.087E 00	1.044E 02	7.189E 02	6.888E 00
8	250.	300.	50.	275.	1.800E-01	1.960E 00	9.800E 01	6.485E 02	6.617E 00
9	300.	350.	50.	325.	8.900E-02	1.600E 00	7.999E 01	5.084E 02	6.356E 00
10	350.	400.	50.	375.	5.000E-02	1.381E 00	6.903E 01	4.217E 02	6.109E 00
11	400.	450.	50.	425.	3.200E-02	1.286E 00	6.431E 01	3.778E 02	5.874E 00
12	450.	500.	50.	475.	2.200E-02	1.235E 00	6.173E 01	3.490E 02	5.654E 00
13	500.	550.	50.	525.	1.600E-02	1.212E 00	6.061E 01	3.301E 02	5.445E 00
14	550.	600.	50.	575.	1.100E-02	1.095E 00	5.475E 01	2.873E 02	5.248E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
3.777E 03	2.816E 04	6.815E 04	46

TOWER CONDITIONS: $\overline{V}_u$ = 7.8 m/s ; T_a = 32.0 °C ; T_i = 35.0 °C ; T_o = 30.8 °C

Range: 4.2 °C ; Approach: 8.1 °C ; Heat Load: ~22.1 MW

AMBIENT CONDITIONS: Wind Speed: 22.3 Km/hr ; Wind Direction: E ; Twet/Tdry = 22.7/25.6 °C

DIAMETER: NW-SE 2 **POSITION:** 23 **DATE:** 3/15/74 **TIME FRAME:** 1426-1511

NOTE: Concurrent IK Data Point: Position 22.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.000E 04	4.189E 01	8.378E 02	9.037E 03	1.079E 01
2	30.	50.	20.	40.	1.600E 03	5.362E 01	1.072E 03	1.153E 04	1.075E 01
3	50.	80.	30.	65.	7.100E 01	1.021E 01	3.063E 02	3.271E 03	1.068E 01
4	80.	110.	30.	95.	8.900E 00	3.995E 00	1.199E 02	1.266E 03	1.056E 01
5	110.	150.	40.	130.	2.800E 00	3.221E 00	1.288E 02	1.340E 03	1.040E 01
6	150.	200.	50.	175.	1.100E 00	3.087E 00	1.543E 02	1.568E 03	1.016E 01
7	200.	250.	50.	225.	5.000E-01	2.982E 00	1.491E 02	1.474E 03	9.888E 00
8	250.	300.	50.	275.	2.500E-01	2.722E 00	1.361E 02	1.309E 03	9.617E 00
9	300.	350.	50.	325.	1.400E-01	2.516E 00	1.258E 02	1.177E 03	9.356E 00
10	350.	400.	50.	375.	7.900E-02	2.181E 00	1.091E 02	9.934E 02	9.109E 00
11	400.	450.	50.	425.	4.000E-02	1.608E 00	8.039E 01	7.134E 02	8.874E 00
12	450.	500.	50.	475.	2.000E-02	1.122E 00	5.612E 01	4.856E 02	8.654E 00
13	500.	550.	50.	525.	1.100E-02	8.334E-01	4.167E 01	3.519E 02	8.445E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
3.318E 03	3.452E 04	9.354E 04	45

TOWER CONDITIONS: $\overline{V}_u$ = 10.8 m/s ; T_a = 31.8°C ; T_i = 35.0 °C ; T_o = 30.6 °C

Range: 4.4 °C ; Approach: 8.6 °C ; Heat Load: ~23.2 MW

AMBIENT CONDITIONS: Wind Speed: 22.3 Km/hr ; Wind Direction: E ; Twet/Tdry = 22.0/25.5 °C

DIAMETER: NW-SE 2 **POSITION:** 24 **DATE:** 3/15/74 **TIME FRAME:** 1540-1628

NOTE: Concurrent IK Data Point: Position 23.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.000E 04	4.189E 01	8.378E 02	9.540E 03	1.139E 01
2	30.	50.	20.	40.	1.300E 03	4.356E 01	8.713E 02	9.891E 03	1.135E 01
3	50.	80.	30.	65.	7.100E 01	1.021E 01	3.063E 02	3.455E 03	1.128E 01
4	80.	110.	30.	95.	8.900E 00	3.995E 00	1.199E 02	1.338E 03	1.116E 01
5	110.	150.	40.	130.	2.500E 00	2.876E 00	1.150E 02	1.265E 03	1.100E 01
6	150.	200.	50.	175.	1.100E 00	3.087E 00	1.543E 02	1.661E 03	1.076E 01
7	200.	250.	50.	225.	5.000E-01	2.982E 00	1.491E 02	1.564E 03	1.049E 01
8	250.	300.	50.	275.	2.200E-01	2.396E 00	1.198E 02	1.224E 03	1.022E 01
9	300.	350.	50.	325.	1.400E-01	2.516E 00	1.258E 02	1.253E 03	9.956E 00
10	350.	400.	50.	375.	8.900E-02	2.457E 00	1.229E 02	1.193E 03	9.709E 00
11	400.	450.	50.	425.	5.000E-02	2.010E 00	1.005E 02	9.521E 02	9.474E 00
12	450.	500.	50.	475.	2.500E-02	1.403E 00	7.014E 01	6.491E 02	9.254E 00
13	500.	550.	50.	525.	1.100E-02	8.334E-01	4.167E 01	3.769E 02	9.045E 00
14	550.	600.	50.	575.	5.600E-03	5.574E-01	2.787E 01	2.466E 02	8.848E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
3.162E 03	3.461E 04	1.038E 05	47

TOWER CONDITIONS: $\overline{V}_u$ = 11.4 m/s ; T_a = 32.2°C ; T_1 = 34.9 °C ; T_O = 30.6 °C

Range: 4.3 °C ; Approach: 8.5 °C ; Heat Load: ~22.7 MW

AMBIENT CONDITIONS: Wind Speed: 22.3 Km/hr ; Wind Direction: E ; Twet/Tdry = 22.1/25.1 °C

DIAMETER: NW-SE 2 POSITION: 25 DATE: 3/15/74 TIME FRAME: 1643-1727

NOTE: Concurrent IK Data Point: Position 24.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	8.900E 03	3.728E 01	7.456E 02	6.701E 03	8.988E 00
2	30.	50.	20.	40.	7.900E 02	2.647E 01	5.295E 02	4.740E 03	8.952E 00
3	50.	80.	30.	55.	7.100E 01	1.021E 01	3.063E 02	2.720E 03	8.880E 00
4	80.	110.	30.	95.	7.100E 00	3.187E 00	9.562E 01	8.379E 02	8.763E 00
5	110.	150.	40.	130.	2.000E 00	2.301E 00	9.203E 01	7.912E 02	8.598E 00
6	150.	200.	50.	175.	1.000E 00	2.806E 00	1.403E 02	1.173E 03	8.361E 00
7	200.	250.	50.	225.	4.500E-01	2.684E 00	1.342E 02	1.085E 03	8.088E 00
8	250.	300.	50.	275.	2.500E-01	2.722E 00	1.361E 02	1.064E 03	7.817E 00
9	300.	350.	50.	325.	1.800E-01	3.235E 00	1.618E 02	1.222E 03	7.556E 00
10	350.	400.	50.	375.	1.100E-01	3.037E 00	1.519E 02	1.110E 03	7.309E 00
11	400.	450.	50.	425.	7.100E-02	2.854E 00	1.427E 02	1.009E 03	7.074E 00
12	450.	500.	50.	475.	4.500E-02	2.525E 00	1.263E 02	8.653E 02	6.854E 00
13	500.	550.	50.	525.	2.800E-02	2.121E 00	1.061E 02	7.049E 02	6.645E 00
14	550.	600.	50.	575.	1.800E-02	1.792E 00	8.959E 01	5.777E 02	6.448E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
2.958E 03	2.460E 04	8.094E 04	70

TOWER CONDITIONS: $\overline{V}_u$ = 9.0 m/s ; T_a = 32.1°C ; T_i = 34.8 °C ; T_o = 30.6 °C

Range: 4.2 °C ; Approach: 8.5 °C ; Heat Load: ~22.1 MW

AMBIENT CONDITIONS: Wind Speed: 22.3 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 22.1/25.0 °C

DIAMETER: NW-SE 2 **POSITION:** 26 **DATE:** 3/15/74 **TIME FRAME:** 1743-1831

NOTE: Concurrent IK Data Point: Position 25.33

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	5.000E 03	2.094E 01	4.189E 02	3.011E 03	7.188E 00
2	30.	50.	20.	40.	5.600E 02	1.877E 01	3.753E 02	2.684E 03	7.152E 00
3	50.	80.	30.	65.	2.200E 01	3.163E 00	9.490E 01	6.719E 02	7.080E 00
4	80.	110.	30.	95.	2.500E 00	1.122E 00	3.367E 01	2.344E 02	6.963E 00
5	110.	150.	40.	130.	7.100E-01	8.167E-01	3.267E 01	2.221E 02	6.798E 00
6	150.	200.	50.	175.	2.800E-01	7.857E-01	3.929E 01	2.578E 02	6.561E 00
7	200.	250.	50.	225.	1.300E-01	7.753E-01	3.877E 01	2.438E 02	6.288E 00
8	250.	300.	50.	275.	5.600E-02	6.098E-01	3.049E 01	1.835E 02	6.017E 00
9	300.	350.	50.	325.	3.200E-02	5.752E-01	2.876E 01	1.655E 02	5.756E 00
10	350.	400.	50.	375.	2.000E-02	5.522E-01	2.761E 01	1.521E 02	5.509E 00
11	400.	450.	50.	425.	1.300E-02	5.225E-01	2.613E 01	1.378E 02	5.274E 00
12	450.	500.	50.	475.	7.100E-03	3.984E-01	1.992E 01	1.007E 02	5.054E 00
13	500.	550.	50.	525.	5.000E-03	3.788E-01	1.894E 01	9.178E 01	4.845E 00
14	550.	600.	50.	575.	3.500E-03	3.484E-01	1.742E 01	8.097E 01	4.648E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	DRIFT MASS EMIS. (UG/SEC)	MASS MEDIAN DIAM. (UM)
1.203E 03	8.237E 03	2.899E 04	40

TOWER CONDITIONS: $\overline{V}_u$ = 7.2 m/s ; T_a =31.5 °C ; T_i = 34.8 °C ; T_o = 30.8 °C

Range: 4.0 °C ; Approach: 8.8 °C ; Heat Load: ~ 21.1 MW

AMBIENT CONDITIONS: Wind Speed: 22.3 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 22.0/25.2 °C

TURKEY POINT ISOKINETIC SAMPLING SUMMARY FOR DIAMETER NW-SE 2

IK Tube Position	Date	M_{Na} (μg)	M_{Mg} (μg)	V_s (m^3)	$\bar{v}_u$ (m/s)	$\frac{\bar{C}_{Na}}{C_{Na}}$	$\frac{\bar{C}_{Mg}}{C_{Mg}}$	F^a_{Na} ($\mu g/m^2 \cdot s$)	F^a_{Mg} ($\mu g/m^2 \cdot s$)	ΔA (m^2)	Δm^a_{Na} (μg/s)	Δm^a_{Mg} (μg/s)
0.3	3/13/74	2,138	203	11.70	4.0	0.82	0.91	599	63	3.25	1,947	205
1.3	3/13/74	3,703	378	13.12	7.0	0.82	0.91	1,620	184	3.62	5,864	666
2.3	3/13/74	5,739	600	20.69	8.1	0.82	0.91	1,842	214	3.33	6,134	713
3.3	3/13/74	6,338	590	18.35	10.0	0.82	0.91	2,832	293	3.04	8,609	891
4.3	3/13/74	8,069	820	17.55	10.1	0.82	0.91	3,808	429	2.74	10,430	1,175
5.3	3/14/74	3,614	402	18.98	9.8	0.87	0.91	1,623	189	2.45	3,976	463
20.3	3/14/74	2,439	248	10.69	4.9	0.87	0.91	973	103	1.93	1,878	199
21.3	3/15/74	3,389	370	15.68	6.45	0.82	0.88	1,143	134	2.22	2,537	297
22.3	3/15/74	2,864	284	16.20	8.9	0.82	0.88	1,290	137	2.52	3,251	345
23.3	3/15/74	2,339	243	15.61	11.15	0.82	0.88	1,370	153	2.81	3,850	430
24.3	3/15/74	3,364	350	12.01	10.95	0.82	0.88	2,515	281	3.10	7,797	871
25.3	3/15/74	1,589	165	9.73	8.35	0.82	0.88	1,118	125	3.39	3,790	424
										TOTALS:	60,063	6,679

TOTAL MASS EMISSION RATES ARE: m^a_{Na} = 60,063 μg/s and m^a_{Mg} = 6,679 μg/s if the basin water concentration equal the mean concentrations $\bar{C}_{Na}$ and $\bar{C}_{Mg}$ as listed in Table 1 , and if the water flow rate equals 1,272 kg/s (or 20,000 gpm).

MINERAL MASS EMISSION FRACTIONS: η_{Na} = 0.00049 %; η_{Mg} = 0.00050%; η = 0.000495%

TURKEY POINT ISOKINETIC DATA EXTENSION FOR DIAMETER NW-SE 2

Position	ϕ^a_{Na} ($\mu g/m^3$)	ϕ^a_{Mg} ($\mu g/m^3$)	$\bar{v}_u$ (m/s)	F^a_{Na} ($\mu g/m^2 \cdot s$)	F^a_{Mg} ($\mu g/m^2 \cdot s$)	ΔA (m^2)	Δm^a_{Na} ($\mu g/s$)	Δm^a_{Mg} ($\mu g/s$)
6.3	167	19.3	10.0	1670	193	2.16	3607	417
7.3	167	19.3	7.9	1319	152	1.87	2467	284
8.3	167	19.3	6.4	1069	124	1.57	1678	195
9.3	167	19.3	2.4	401	46.3	1.28	513	59.3
17.3	199	21.0	0.5	99.5	10.5	1.08	107	11.3
18.3	199	21.0	1.8	358	37.8	1.33	476	50.3
19.3	199	21.0	3.3	657	69.3	1.61	1058	112
26.3	134	15.0	6.7	898	101	6.12	5496	618
						TOTALS:	15,402	1,747

UPPER LIMIT OF MINERAL MASS EMISSION FRACTIONS:

$\eta'_{Na} = 0.00062\%$ $\eta'_{Mg} = 0.00063\%$ $\eta' = 0.00062\%$

Table 8

COOLING TOWER DRIFT DATA SUPPLEMENT AS ACQUIRED BY SP LARGE STAIN COUNT

Diameter	Position	Droplet Diameters (μm)	Flux Due to Droplets >600 μm (μg/m² · sec)	Flux Due to Droplets <600 μm (μg/m² · sec)	Percent*
SW-NE 1	23	860	3,170	99,100	3
SW-NE 1	24	1620	21,300	83,500	26
SW-NE 1	27	850, 2240, 1200	136,000	54,000	252
NW-SE 1	24	1090	6,550	54,900	12
SW-NE 2	22	1070	18,500	22,800	8
NW-SE 2	1	1570	58,000	26,000	223
NW-SE 2	2	670	4,580	34,000	13
NW-SE 2	3	610	3,340	109,000	3
NW-SE 2	4	960, 670	8,860	82,600	11
NW-SE 2	21	710, 960	4,730	26,900	18
NW-SE 2	24	1100, 910, 710	12,400	34,600	36
NW-SE 2	26	680, 1150	3,060	8,240	37
SW-NE 3	2	660, 680	1,290	19,400	7
SW-NE 3	3	640, 670	2,420	38,000	6
SW-NE 3	4	690, 610 660, 1010, 610 660, 620, 680	9,570	74,100	13
SW-NE 3	5	650, 650, 900	4,330	41,900	10
SW-NE 3	6	1320, 780, 1970	26,200	64,900	40
SW-NE 3	23	1340	52,000	376,000	14
SW-NE 3	24	950, 1510	50,000	149,000	33
SW-NE 3	25	790, 1900	111,000	141,000	78

* % = (Flux due to droplets >600 μm/Flux due to droplets <600 μm) x 100%

APPENDIX F

COOLING TOWER DRIFT EMISSION DATA ACQUIRED FOR FLORIDA POWER AND LIGHT COMPANY

(Report released courtesy of Florida Power and Light Company)

P.O. BOX 3100 MIAMI, FLORIDA 33101

FPL
FLORIDA POWER & LIGHT COMPANY

August 30, 1974

Dr. Gunter O. Schrecker
Environmental Systems Corporation
P. O. Box 2525
Knoxville, Tennessee 37901

Dear Dr. Schrecker:

On February 27, 1974 you conducted a special test on the Turkey Point cooling tower for Florida Power & Light Company, in addition to tests done under your contract with the Environmental Protection Agency. This was done to provide us with some information on the cooling tower drift characteristics sooner than would have been available from reports of the tests funded by EPA.

Florida Power & Light Company has no objection to the inclusion of the February 27, 1974 test data and results in the report you make to EPA on the Turkey Point test program if it is felt this might add any value to the report.

Sincerely,

C. D. Henderson

C. D. Henderson
Manager of Environmental Engineering

CDH/SHD/ayg

cc: D. D. Dunlop
R. L. Lyerly
E. C. Weber

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SEP 06 1974
ENVIRONMENTAL SYSTEMS CORP.

ENVIRONMENTAL SYSTEMS CORPORATION

POST OFFICE BOX 2525
KNOXVILLE, TENNESSEE 37901

(615) 573-7931

CHARACTERIZATION OF DRIFT EMISSION OF THE TURKEY POINT COOLING TOWER OF FLORIDA POWER & LIGHT COMPANY

by

Gunter O. Schrecker
Ronald O. Webb

Test Performed for Florida Power & Light Company

February 27, 1974

Purchase Order No. 30069-86108

Final Report Submitted

August 1974 (amended June 1975)

(Preliminary Report Submitted March 1974)

CHARACTERIZATION OF DRIFT EMISSION OF THE TURKEY POINT COOLING TOWER OF FLORIDA POWER & LIGHT

On February 27, 1974, drift characterization tests were performed along the northwest radius (Figure 1) of the Marley 600/700 single cell mechanical draft cooling tower located at the Turkey Point Plant of Florida Power & Light. The following instruments were contained in the instrument package that made measurements along this radius:

1. The PILLS II-A (Particulate Instrumentation by Laser Light Scattering) System provided particle density distribution data in the range between approximately 40 μm and 1,000 μm.
2. The SP (Sensitive Paper) System provided particle density distribution data in the range of approximately 10 μm to 400 μm.
3. The IK (Isokinetic Sampling) System provided mass emission data.
4. A Gill Propeller Anemometer provided air updraft velocity data.
5. A dry bulb/wet bulb psychrometer provided data on the temperature distribution along the radius.

An on-site meteorological tower provided wind speed and direction, as well as ambient dry bulb/wet bulb data. The tower inlet and outlet water temperatures, as well as the heads in each hot water distribution basin were also measured whenever drift data were acquired by both the PILLS and SP Systems.

The following table gives information on the mode of drift data acquisition at those positions where measurements were carried out:

POSITION	0	1	2	3	4	5	6	7
DRIFT DATA ACQUISITION SYSTEM EMPLOYED:	SP	SP	SP	SP	SP	SP	SP	SP
	IK	IK	IK	IK	IK			
		PILLS	PILLS	PILLS	PILLS	PILLS		

Figure 2 shows the updraft velocity profile for the northwest radius. The average velocity at each point, as well as the range of velocity fluctuations are entered. Negative (downward) velocities were not determined since the read-out of the Gill Propeller Anemometer does not provide for negative voltages. At position 7 the propeller stopped and reversed its direction of rotation at times, whereas this became a frequent feature at position 8 and, in particular, at position 9. For all other positions between 9 and the center of the exit area, highly fluctuating and mostly downward velocities were observed. The temperatures that were measured along the entire northwest radius are all between 22.5 (72.5°F) and 23.3°C (73.9°F), with the higher temperatures at positions 1-5 and over the hub.

Tables I-1 to I-8 present the particle density distribution data p(d) and the mass density data $\Delta\chi$ for positions 0 to 7. d'-d" are the edge particle diameters, $\bar{d}$ the center diameter and Δd the width of the various particle size ranges. m_p is the mass of one droplet with a diameter equal to the center diameter. p(d) is the particle density distribution expressed as the number of particles per unit particle size range and unit volume of sampled air which is discussed in more detail in Appendix 3. $\Delta\chi$ is the mass of drift per unit volume of air for each particle size range and d_{mm} is the mass median diameter. The drift mass density at the measuring point is obtained by summing over the particle size ranges. The p(d) data presented here are refined from the values presented in the earlier preliminary field report. Correction factors have been applied in a computerized data reduction to account for the collection efficiency of the SP discs in the small size ranges and to account for the response characteristics of PILLS II-A. These factors were not applied in the simpler preliminary data reduction carried out in the field in order to present the major results immediately. The tablets also contain information on the ambient conditions, as well as on various tower operational parameters like heat load and approach. These data were acquired at the same time as the drift data. Dimensions of the fill geometry are presented in Appendix A in order to facilitate comparisons of this tower with other cooling towers.

A note is necessary with respect to the tower inlet and outlet temperatures. All inlet temperatures were measured with a mercury thermometer in the hot water distribution basin. The outlet temperatures were read at the thermometer that is located at the wooden staircase with the sensor in the inlet of the discharge pipe. This thermometer was calibrated three times against a mercury thermometer and it was found that it reads at least 3°F too low. Therefore, 3°F was added to all discharge temperatures read at this thermometer.

The isokinetically obtained drift data are tabulated in Table II. The IK-tube at position 0.2 and PILLS II-A at position 1 were run simultaneously since the IK-tube is 0.8 ft. away from the PILLS II-A sampling volume. This holds equally for the other positions of the IK.

The apparent drift mass determined from the mass of magnesium and sodium collected in the IK-tubes are in close agreement for four of the five tubes. Comparing the average drift mass density $\overline{X}$ to that determined by the PILLS and SP System, it is readily noticed that $\overline{X}$ IK is larger than XPILLS/SP by a factor of approximately 5 to 10. It is believed that this difference is mainly due to the increased mineral concentration of the smaller droplets which carry the bulk of the evaporative heat rejection process. Since the IK-tubes collect the minerals contained in the drift droplets, an assumption has to be made to arrive at an apparent drift droplet density. This assumption is that the drift droplet mineral concentration is the same as the basin water mineral concentration. If any heat is rejected by the cooling tower, the drift droplet mineral concentration will increase which yields, with the stated assumption, an apparent drift mass concentration that is too large.

The drift fraction expresses the drift mass emission in per cent of the circulating water rate. Based on the five IK-tubes that were exposed at position .2 to 4.2, the drift fraction of the tower was calculated as .00062%.

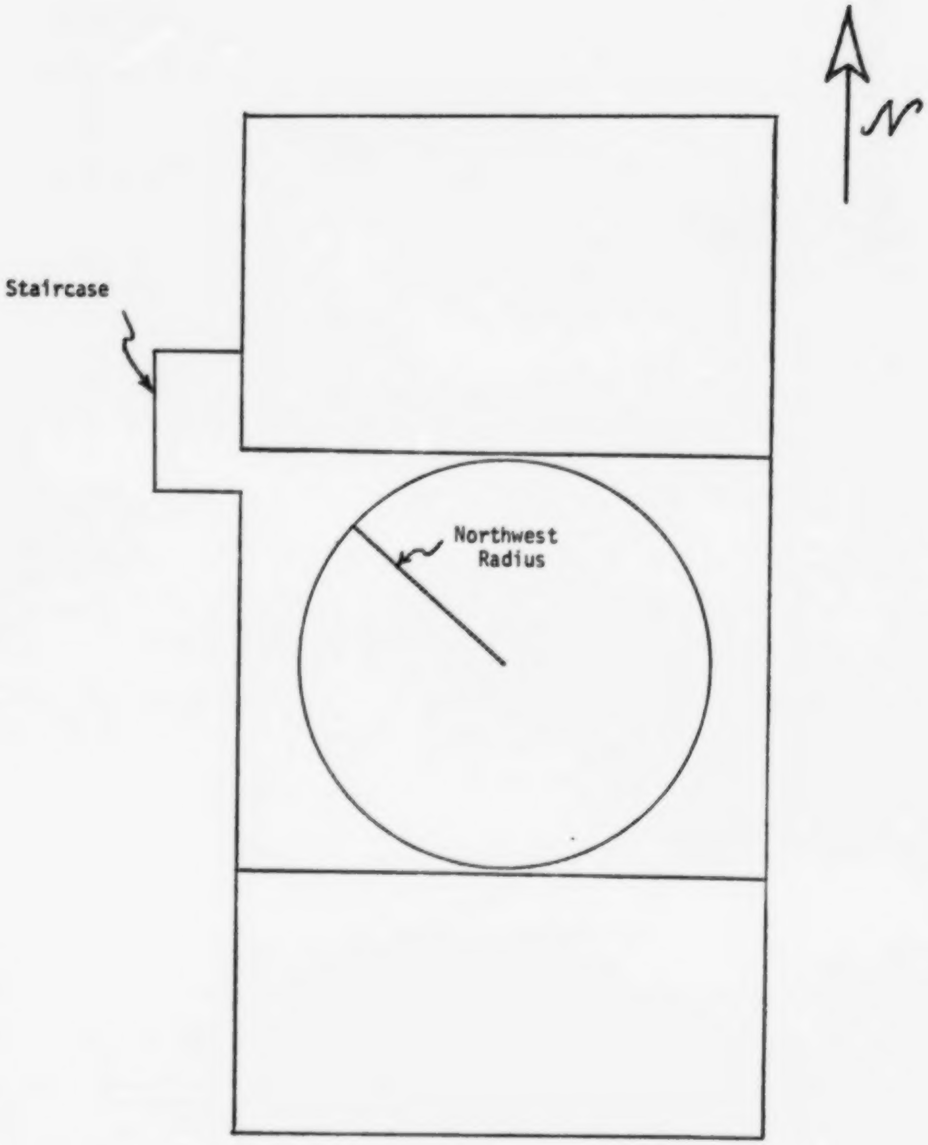
No isokinetic sampling tubes were exposed between position 4.2 and the center of the fan stack exit area. The rate of drift mass emission is usually decreasing rapidly at positions that are located between the peak of the velocity profile and the point where the average velocity is zero, since both the drift mass density $\overline{X}$ and the updraft velocity are usually decreasing. Here, however, the drift mass density has its largest value at position 4.2 and the rate of drift mass emission is slightly larger at position 4.2 than at position 3.2. It therefore became clear during the data reduction that at least one more IK data point would have been useful.

In order to derive an upper limit for the drift fraction, the rates of drift mass emission were calculated for positions 5.2, 6.2, 7.2 and 8.2, using the measured updraft velocities at these positions and assuming that the drift mass density remains constant at 30,000 $\mu g/m^3$, although in reality the drift mass density decreases rapidly. This assumption appears to be justified in order to arrive at an upper limit for the drift fraction. The results are shown below.

Position	Area of Annulus (m^2)	$\bar{X}$ ($\mu g/m^3$)	Updraft Velocity V (m/sec.)	Drift Mass Flux $\bar{X} \cdot V$ ($\mu g/m^2 sec.$)	Rate of Drift Mass Emission (g/sec)
5.2	4.73	30,000	9.5	285,000	1.35
6.2	4.29	↓	6.1	183,000	0.79
7.2	3.69		3.5	105,000	0.39
8.2	3.00		1.5	45,000	0.14
					2.67

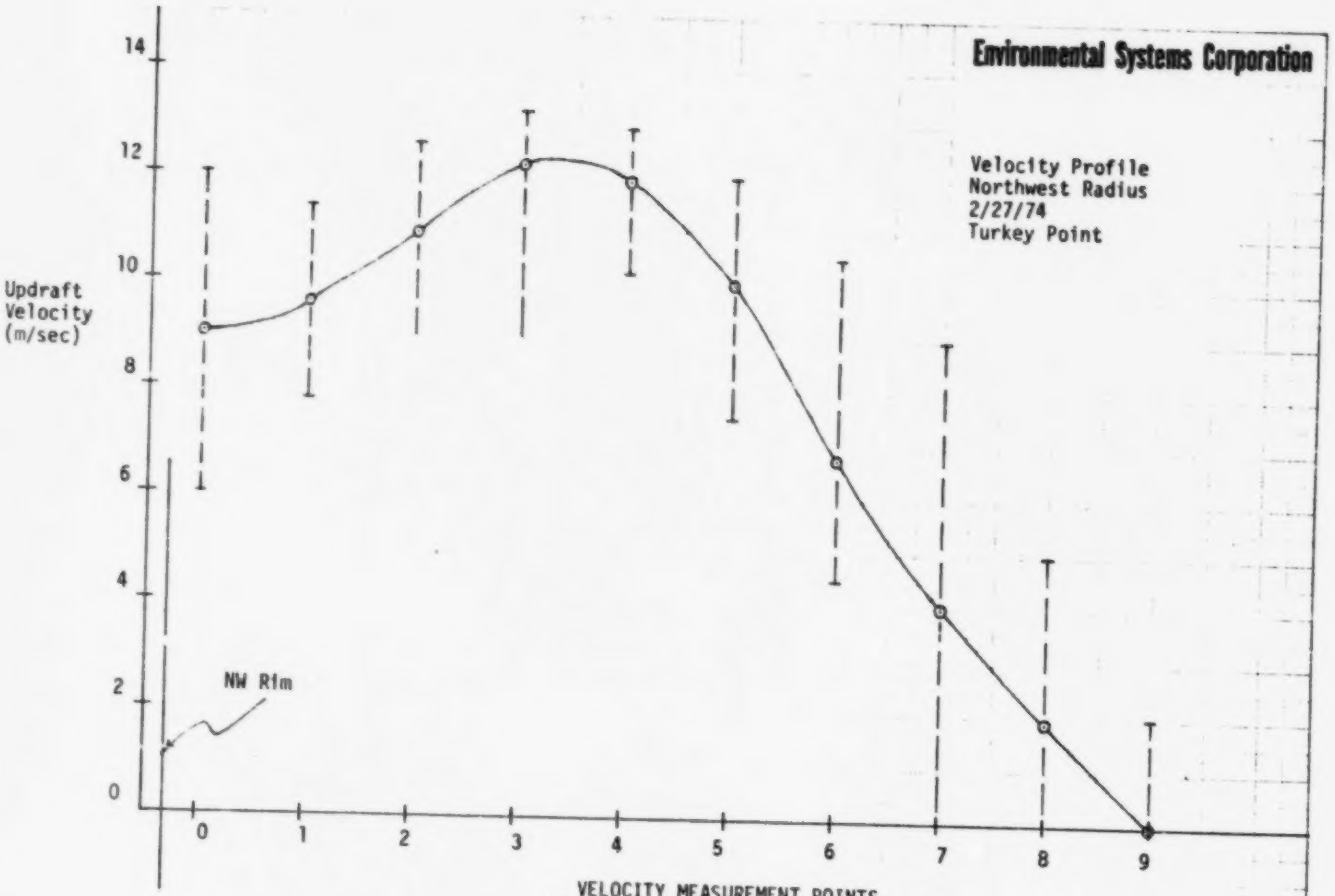
$$\text{Upper Limit of Drift Fraction} = \frac{7.87 + 2.67}{1.262 \times 10^6} \times 100\% = 0.00084\%$$

Drift mass emission rates, both measured and estimated are plotted in Figure 3.



MARLEY 600/700 SINGLE CELL MECHANICAL DRAFT COOLING TOWER
Installed at the Turkey Point Plant of Florida Power & Light
(view from above shows radius along which drift measurements were taken)

FIGURE 1



VELOCITY MEASUREMENT POINTS
(distance between points = 1 ft.)
Diameter of Fan Stack Exit = 8.37m = 27'5.5"
FIGURE 2

ENVIRONMENTAL SYSTEMS CORPORATION

POST OFFICE BOX 2525
KNOXVILLE, TENNESSEE 37901

(615) 573-7931

MARLEY 600/700 SINGLE CELL MECHANICAL DRAFT COOLING TOWER INSTALLED AT THE TURKEY POINT PLANT OF FLORIDA POWER & LIGHT

Date/Time Range: 2-27-74/11:54 - 13:10; Test Position: NW Radius, Position 0

Test Conditions: Avg. Updraft Velocity 9 m/sec; Avg. Air Discharge Temp. - °F

Tower Outlet Water Temp: * °F; Tower Inlet Water Temp: * °F

Range: * °F; Approach * °F

Heat Load: * BTU/hr.

Volumetric Air Flow Rate: 924600 cfm.

Volumetric Water Flow Rate: 20000 gpm (according to design specs)

Ambient Conditions: Wind Speed: * mph, Wind Direction: *

T_{dry}/T_{wet} * / * °F

*See data for Position 1

d'-d" µm	$\bar{d}$ µm	Δd µm	m_p µg	p(d) #/µm·m³	ΔX_i µg/m³
0 - 20	10	20	5.236×10^{-4}	15000	157
40	30		0.0141	2080	587
60	50		0.0654	250	327
80	70		0.1796	70	251.4
100	90		0.382	27	206.3
120	110		0.697	11	153.3
140	130		1.150	5.8	133.4
180	160	40	2.145	2.2	188.76
220	200		4.189	0.68	113.9
260	240		7.238	0.23	66.6
300	280		11.49		
340	320		17.16		
380	360		24.43		
420	400		33.51		
460	440		44.60		
500	480		57.91		
540	520		73.62		
580	560		91.95		
620	600		113.1		

2184 µg/m³

d_{nm} = 62 µm

TABLE I-2

ENVIRONMENTAL SYSTEMS CORPORATION

POST OFFICE BOX 2525
KNOXVILLE, TENNESSEE 37901

(615) 573-7931

MARLEY 600/700 SINGLE CELL MECHANICAL DRAFT COOLING TOWER
INSTALLED AT THE TURKEY POINT PLANT OF FLORIDA POWER & LIGHT

Date/Time Range: 2-27-74/11:55-13:06 ; Test Position: NW Radius, Position 1

Test Conditions: Avg. Updraft Velocity 9.6 m/sec; Avg. Air Discharge Temp. - °F

Tower Outlet Water Temp: 72.5 °F; Tower Inlet Water Temp: 80.2 °F

Range: 7.7 °F; Approach 20.5 °F

Heat Load: 7.7×10^7 BTU/hr.

Volumetric Air Flow Rate: 924600 cfm.

Volumetric Water Flow Rate: 20000 gpm (according to design specs)

Ambient Conditions: Wind Speed: 7 mph, Wind Direction: NNW

T_{dry}/T_{wet} 57.6/52.0 °F

d'-d" µm	$\bar{d}$ µm	Δd µm	m_p µg	p(d) #/µm·m^3	ΔX_i µg/m^3
0 - 20	10	20	5.236×10^{-4}	25000	262
40	30		0.0141	3330	940
60	50		0.0654	250	327
80	70		0.1796	28.2	101
100	90		0.382	8.5	65
120	110		0.697	4.0	56
140	130	↓	1.150	2.24	52
180	160	40	2.145	.792	68
220	200		4.189	.282	47
260	240		7.238	.085	25
300	280		11.49	.0354	16
340	320		17.16		
380	360		24.43		
420	400		33.51		
460	440		44.60		
500	480		57.91		
540	520		73.62		
580	560		91.95		
620	600	↓	113.1		

1959 µg/m^3

d_{mm} = 35 µm

TABLE I-3

ENVIRONMENTAL SYSTEMS CORPORATION

POST OFFICE BOX 2525
KNOXVILLE, TENNESSEE 37901

(615) 573-7931

MARLEY 600/700 SINGLE CELL MECHANICAL DRAFT COOLING TOWER INSTALLED AT THE TURKEY POINT PLANT OF FLORIDA POWER & LIGHT

Date/Time Range: 2-27-74/13:13-14:25 ; Test Position: NW Radius, Position 2

Test Conditions: Avg. Updraft Velocity 10.9 m/sec; Avg. Air Discharge Temp. 73.0 °F

Tower Outlet Water Temp: 72.5°F; Tower Inlet Water Temp: 79.5 °F

Range: 7.0 °F; Approach 19.1 °F

Heat Load: 7.0×10^7 BTU/hr.

Volumetric Air Flow Rate: 924600 cfm.

Volumetric Water Flow Rate: 20000 gpm (according to design specs)

Ambient Conditions: Wind Speed: 8 mph, Wind Direction: N

T_{dry}/T_{wet} 57.2/53.4 °F

d'-d" µm	$\bar{d}$ µm	Δd µm	m_p µg	p(d) #/µm·m³	ΔX_i µg/m³
0 - 20	10	20	5.236×10^{-4}	25000	262
40	30	↓	0.0141	3330	939
60	50		0.0654	350	458
80	70		0.1796	125	449
100	90		0.382	40	306
120	110		0.697	16	223
140	130		1.150	8.9	205
180	160	40	2.145	4	343
220	200	↓	4.189	1.2	201
260	240		7.238	.315	91
300	280		11.49	.125	57
340	320		17.16	.0562	39
380	360		24.43	.0282	28
420	400		33.51	.016	21
460	440		44.60	.0091	16
500	480		57.91	.0071	16
540	520		73.62	.00406	12
580	560		91.95	.00315	16
620	600		113.1	.0004	11
					3693 µg/m³

d_{mm} = 68 µm

TABLE I-4

ENVIRONMENTAL SYSTEMS CORPORATION

POST OFFICE BOX 2525
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(615) 573-7931

MARLEY 600/700 SINGLE CELL MECHANICAL DRAFT COOLING TOWER INSTALLED AT THE TURKEY POINT PLANT OF FLORIDA POWER & LIGHT

Date/Time Range: 2-27-74/14:27-15:36 ; Test Position: NW Radius, Position 3

Test Conditions: Avg. Updraft Velocity 12.2 m/sec; Avg. Air Discharge Temp. 73.6 °F

Tower Outlet Water Temp: 72.5 °F; Tower Inlet Water Temp: 79.2 °F

Range: 6.7 °F; Approach 18.7 °F

Heat Load: 6.7×10^7 BTU/hr.

Volumetric Air Flow Rate: 924600 cfm.

Volumetric Water Flow Rate: 20000 gpm (according to design specs)

Ambient Conditions: Wind Speed: 8 mph, Wind Direction: NNE

T_{dry}/T_{wet} 62.2/53.8 °F

d'-d" µm	$\bar{d}$ µm	Δd µm	m_p µg	p(d) #/µm·m^3	ΔX_i µg/m^3
0 - 20	10	20	5.236×10^{-4}	25000	262
40	30		0.0141	2670	753
60	50		0.0654	300	392
80	70		0.1796	87	313
100	90		0.382	32.5	248
120	110		0.697	16	223
140	130		1.150	11	253
180	160	40	2.145	6	515
220	200		4.189	2.25	377
260	240		7.238	.63	182
300	280		11.49	.23	106
340	320		17.16	.12	82
380	360		24.43	.08	78
420	400		33.51	.046	62
460	440		44.60	.0225	40
500	480		57.91	.012	28
540	520		73.62	.0071	21
580	560		91.95	.0045	16
620	600		113.1	.00315	14

3965 µg/m^3

d_{mm} = 101 µm

TABLE I-5

ENVIRONMENTAL SYSTEMS CORPORATION

POST OFFICE BOX 2525
KNOXVILLE, TENNESSEE 37901

(615) 573-7931

MARLEY 600/700 SINGLE CELL MECHANICAL DRAFT COOLING TOWER
INSTALLED AT THE TURKEY POINT PLANT OF FLORIDA POWER & LIGHT

Date/Time Range: 2-27-74/15:39-16:32 ; Test Position: NW Radius, Position 4

Test Conditions: Avg. Updraft Velocity 11.9 m/sec; Avg. Air Discharge Temp. 73.8 °F

Tower Outlet Water Temp: 72.8 °F; Tower Inlet Water Temp: 79.0 °F

Range: 6.2 °F; Approach 17.4 °F

Heat Load: 6.2×10^7 BTU/hr.

Volumetric Air Flow Rate: 924600 cfm.

Volumetric Water Flow Rate: 20000 gpm (according to design specs)

Ambient Conditions: Wind Speed: 9 mph, Wind Direction: NNE

T_{dry}/T_{wet} 63.1/55.4 °F

d'-d" μm	$\bar{d}$ μm	Δd μm	m_p μg	p(d) #/μm·m^3	ΔX_i μg/m^3
0 - 20	10	20	5.236×10^{-4}	31250	328
40	30	↓	0.0141	2170	612
60	50	↓	0.0654	290	379
80	70	↓	0.1796	88	316
100	90	↓	0.382	45	344
120	110	↓	0.697	16	223
140	130	↓	1.150	9	207
180	160	40	2.145	5.62	482
220	200	↓	4.189	2.3	385
260	240	↓	7.238	.795	230
300	280	↓	11.49	.36	165
340	320	↓	17.16	.17	117
380	360	↓	24.43	.085	83
420	400	↓	33.51	.045	60
460	440	↓	44.60	.026	46
500	480	↓	57.91	.0165	38
540	520	↓	73.62	.01125	33
580	560	↓	91.95	.0079	29
620	600	↓	113.1	.0065	29

4106 μg/m^3

d_{mm} = 107 μm

TABLE I-6

ENVIRONMENTAL SYSTEMS CORPORATION

POST OFFICE BOX 2525
KNOXVILLE, TENNESSEE 37901

(615) 573-7931

MARLEY 600/700 SINGLE CELL MECHANICAL DRAFT COOLING TOWER
INSTALLED AT THE TURKEY POINT PLANT OF FLORIDA POWER & LIGHT

Date/Time Range: 2-27-74/16:35-17:27 ; Test Position: NW Radius, Position 5

Test Conditions: Avg. Updraft Velocity 10.0 m/sec; Avg. Air Discharge Temp. 73.6°F

Tower Outlet Water Temp: 72.5 °F; Tower Inlet Water Temp: 78.8 °F

Range: 6.3 °F; Approach 16.2 °F

Heat Load: 6.3×10^7 BTU/hr.

Volumetric Air Flow Rate: 924600 cfm.

Volumetric Water Flow Rate: 20000 gpm (according to design specs)

Ambient Conditions: Wind Speed: 9 mph, Wind Direction: NNE

T_{dry}/T_{wet} 62.2/56.3 °F

d'-d" µm	$\bar{d}$ µm	Δd µm	m_p µg	p(d) #/µm·m^3	ΔX_i µg/m^3
0 - 20	10	20	5.236×10^{-4}	20000	210
40	30	↓	0.0141	1670	471
60	50		0.0654	280	366
80	70		0.1796	120	431
100	90		0.382	44	336
120	110		0.697	20	279
140	130		1.150	9.2	212
180	160	40	2.145	3.3	283
220	200	↓	4.189	1.25	209
260	240		7.238	.55	159
300	280		11.49	.28	129
340	320		17.16	.155	106
380	360		24.43	.075	73
420	400		33.51	.04	54
460	440		44.60	.021	37
500	480		57.91	.012	28
540	520		73.62	.0063	19
580	560		91.95		
620	600		113.1		

3402 µg/m^3

d_{mn} = 93 µm

TABLE I-7

ENVIRONMENTAL SYSTEMS CORPORATION

POST OFFICE BOX 2525
KNOXVILLE, TENNESSEE 37901

(615) 573-7931

MARLEY 600/700 SINGLE CELL MECHANICAL DRAFT COOLING TOWER INSTALLED AT THE TURKEY POINT PLANT OF FLORIDA POWER & LIGHT

Date/Time Range: 2-27-74/17:31-17:37 ; Test Position: NW Radius, Position 6

Test Conditions: Avg. Updraft Velocity 6.8 m/sec; Avg. Air Discharge Temp. 74.3°F

Tower Outlet Water Temp: * °F; Tower Inlet Water Temp: * °F

Range: * °F; Approach * °F

Heat Load: * BTU/hr.

Volumetric Air Flow Rate: 924600 cfm.

Volumetric Water Flow Rate: 20000 gpm (according to design specs)

Ambient Conditions: Wind Speed: * mph, Wind Direction: *

T_{dry}/T_{wet} * / * °F

*see data for Position 5

d'-d" µm	$\bar{d}$ µm	Δd µm	m_p µg	p(d) #/µm·m³	ΔX_i µg/m³
0 - 20	10	20	5.236×10^{-4}	15000	157
40	30	↓	0.0141	1670	470
60	50		0.0654	210	275
80	70		0.1796	70	251
100	90		0.382	28	214
120	110		0.697	13	181
140	130		1.150	7	161
180	160	40	2.145	3.1	266
220	200	↓	4.189	1.3	218
260	240		7.238	0.56	162
300	280		11.49	0.23	106
340	320		17.16	0.10	68.6
380	360		24.43		
420	400		33.51		
460	440		44.60		
500	480		57.91		
540	520		73.62		
580	560		91.95		
620	600		113.1		

2529.6 µg/m³

d_{mm} = 90 µm

TABLE 1-8

ENVIRONMENTAL SYSTEMS CORPORATION

POST OFFICE BOX 2525
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(615) 573-7931

MARLEY 600/700 SINGLE CELL MECHANICAL DRAFT COOLING TOWER INSTALLED AT THE TURKEY POINT PLANT OF FLORIDA POWER & LIGHT

Date/Time Range: 2-27-74/17:40-17:43 ; Test Position: NW Radius, Position 7

Test Conditions: Avg. Updraft Velocity 4.0 m/sec; Avg. Air Discharge Temp. * °F

Tower Outlet Water Temp: * °F; Tower Inlet Water Temp: * °F

Range: * °F; Approach * °F

Heat Load: * BTU/hr.

Volumetric Air Flow Rate: 924600 cfm.

Volumetric Water Flow Rate: 20000 gpm (according to design specs)

Ambient Conditions: Wind Speed: * mph, Wind Direction: *

T_{dry}/T_{wet} * / * °F

*see data for Position 5

d'-d" µm	$\bar{d}$ µm	Δd µm	m_p µg	p(d) #/µm·m^3	ΔX_i µg/m^3
0 - 20	10	20	5.236×10^{-4}	15000	157.1
40	30		0.0141	1670	470
60	50		0.0654	225	294
80	70		0.1796	64	230
100	90		0.382	24	183
120	110		0.697	13	181
140	130	↓	1.150	7.5	173
180	160	40	2.145	3.2	275
220	200		4.189	1.2	201
260	240		7.238	0.48	139
300	280		11.49	0.21	96.5
340	320		17.16	.08	54.9
380	360		24.43		
420	400		33.51		
460	440		44.60		
500	480		57.91		
540	520		73.62		
580	560		91.95		
620	600	↓	113.1		

2454.5 µg/m^3

d_{min} = 88 µm

TABLE II: ISOKINETIC SAMPLING SUMMARY

Date: 2/27/74 Test Cell: Marley 600/700 Mechanical Draft Cooling Tower, Installed at the Turkey Point Plant of Florida Power & Light

Position of IK-Tube	Distance of IK-Tube From NW Rim [m]	A Area of Annulus the IK-Tube is Representing [m2]	Sampled Air Volume [m3]	Collected Mass of Elements M_{Na} [μg]	M_{Mg} [μg]	x_{Na} $\left[\frac{\mu g}{m^3}\right]$	x_{Mg} $\left[\frac{\mu g}{m^3}\right]$	$\bar{x}$ $\left[\frac{\mu g}{m^3}\right]$	$\bar{V}$ Updraft Velocity at IK-Pos. [m/sec]	Drift Mass Flux $\bar{x} \times \bar{V}$ $\left[\frac{\mu g}{m^2 \, sec}\right]$	Rate of Drift Mass Emission $\bar{x}\bar{V}A$ [g/sec]
.2	.15	7.73	18.34	2,086	228	17,168	16,624	16,896	9.1	153,754	1.19
1.2	.46	7.03	19.58	2,550	293	19,654	20,006	19,830	9.8	194,334	1.37
2.2	.76	6.66	23.93	3,159	359	19,926	20,056	19,991	11.2	223,899	1.49
3.2	1.07	5.88	15.63	2,729	310	26,355	26,509	26,432	12.2	322,470	1.90
4.2	1.37	5.48	13.57	2,847	283	31,668	27,881	29,775	11.7	348,368	1.91

Total Drift Mass Emission: 7.86 g/sec

Drift Fraction:

$$\Delta = \frac{\text{total drift emission}\,[g/sec]}{\text{circulating water rate}\,[g/sec]} \times 100\% = \frac{7.86 \times 100\%}{1.262 \times 10^6} = .00062\%$$

The apparent drift mass density x is calculated with the assumption that the drift droplets have the same concentration of minerals as the circulating water.

Water flow rate: 20,000 gpm (according to design specs)

Concentration of elements in feeder canal (2/27/74) : $C_{Na} = 6625$ ppm, $C_{Mg} = 748$ ppm

Drift Mass Emission Rate
Northwest Radius
2/27/74
Turkey Point

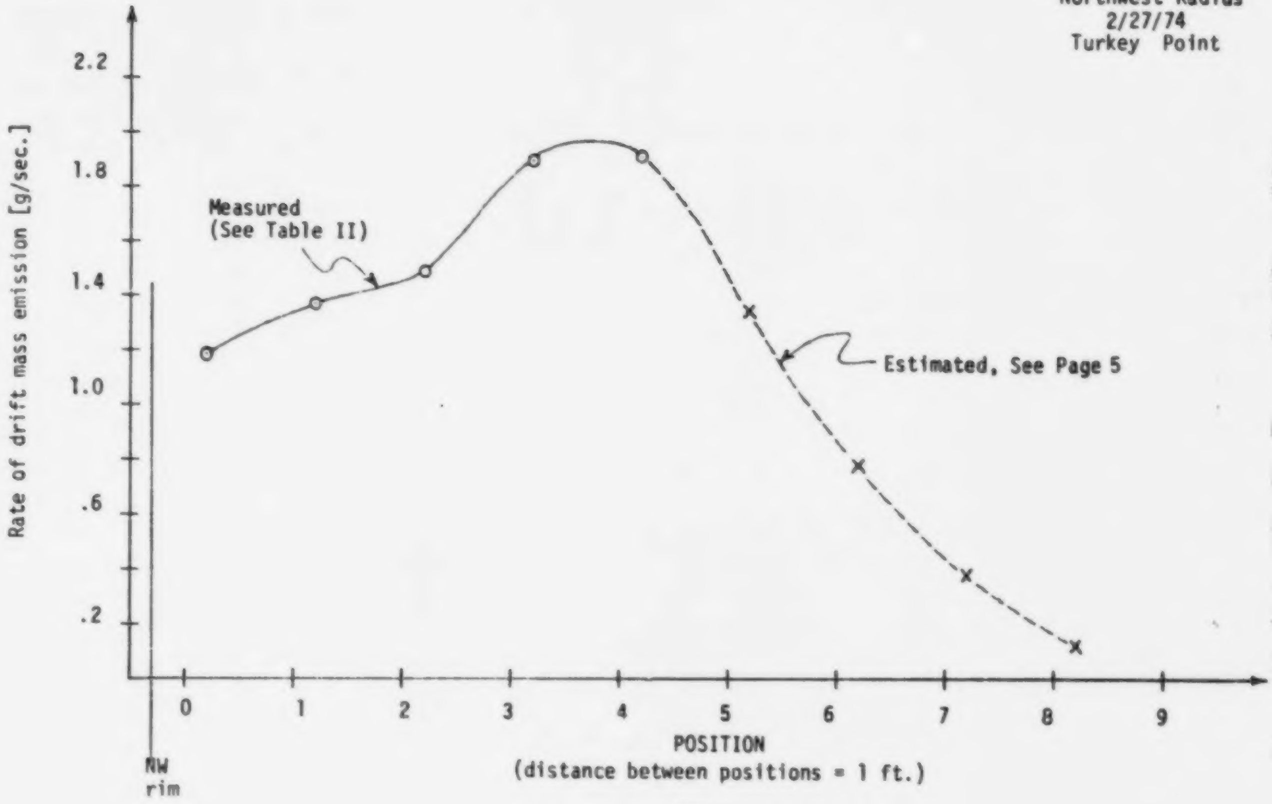

FIGURE 3

ENVIRONMENTAL SYSTEMS CORPORATION

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APPENDIX A

Description of cooling tower fill

	Wooden Side	Concrete Side
Depth of Fill: (at lowest point)		
From d.e. to outer end of splash bars	22' 3 1/2"	17' 10"
Total length of splash bars	16' 1 1/8"	15' 7 3/4"
Width of Fill:	39' 2 3/4"	
Height of Fill:		
From lowest splash bar to highest	23' 5 1/4"	23' 6"
From lowest splash bar to nozzles	24' 1 1/4"	24' 6"

Vertical spacing of splash bars	12"
Horizontal spacing of splash bars	4"

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(615) 573-7931

APPENDIX B

Whenever particle size data are acquired, either by the PILLS or the SP technique, or both, a particle density distribution, p(d), is generated from the data. Each measurement technique yields the number of particles per unit volume of air in several particle size ranges. The number of particle size ranges, and their lower and upper edge diameters were selected before the start of the test and remained the same during the test.

Data points of the particle density distribution are obtained by dividing the number of droplets in each particle size range by the width of the size range, Δd. As an example, these data points are plotted for Position 5 in Figure 4. A consolidated particle density curve is fitted through the data points, and p(d)-values are read from the curve at selected center diameters $\bar{d}$ and listed in Table I-6.

The procedure of obtaining the consolidated particle density curve and tabulating p(d)-values at selected diameters was the same for all test positions except at positions 0, 6 and 7, where the consolidated curve was obtained only from SP Small and Medium Stain Counts, since no PILLS data were acquired there. "Small" and "Medium Stain Count" refers to different stain size ranges which are counted and sized. The Small Stain Count consists of counting and sizing about 250 stains of diameters smaller than 300 to 400 micrometers, whereas about 150 stains of diameters between 200 and 1,500 micrometers are counted and sized during the Medium Stain Count.

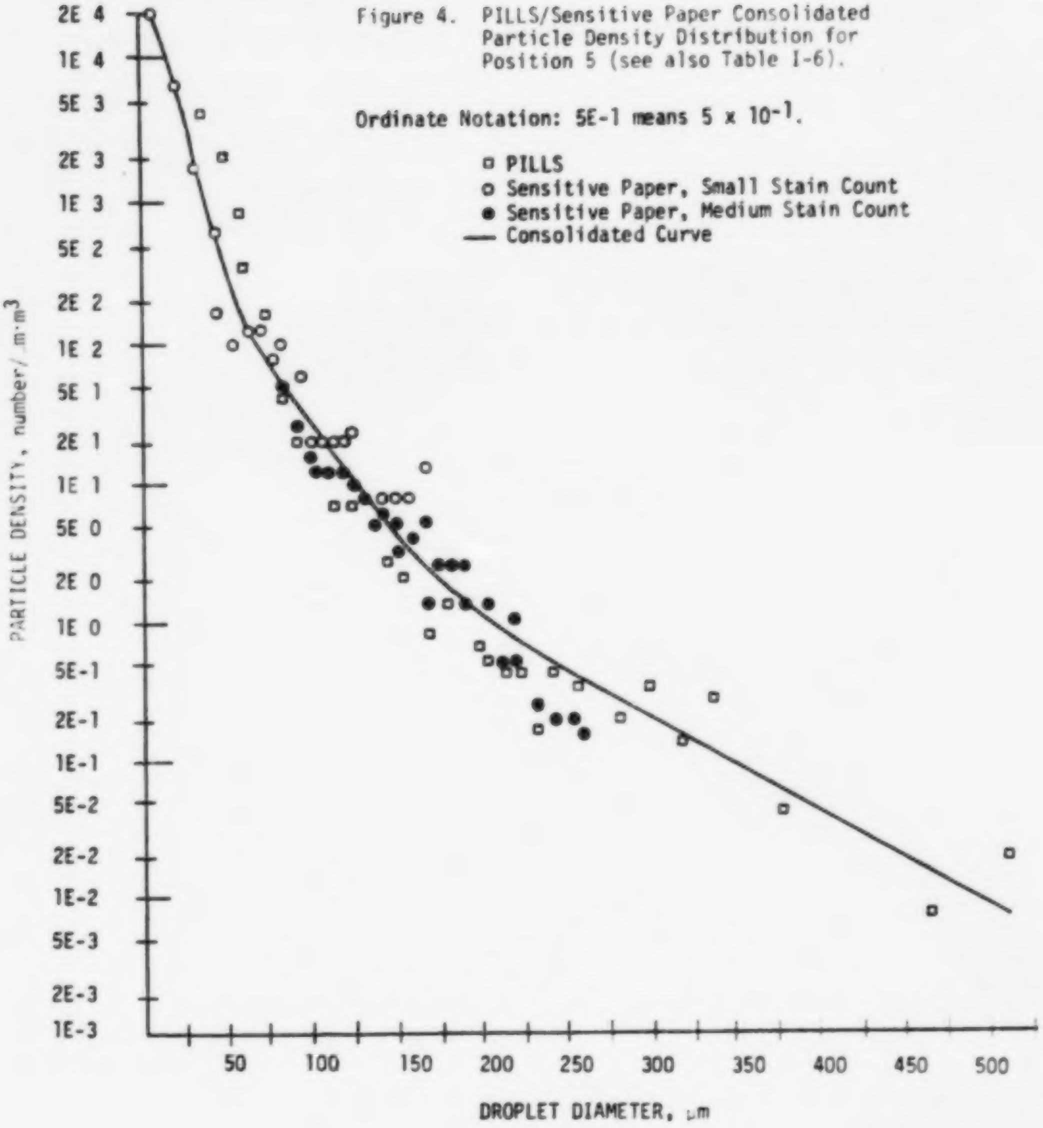

Figure 4. PILLS/Sensitive Paper Consolidated Particle Density Distribution for Position 5 (see also Table I-6).

Ordinate Notation: 5E-1 means 5 x 10^{-1}.

APPENDIX G

DRIFT EMISSION DATA FOR THE SPRAY MODULES

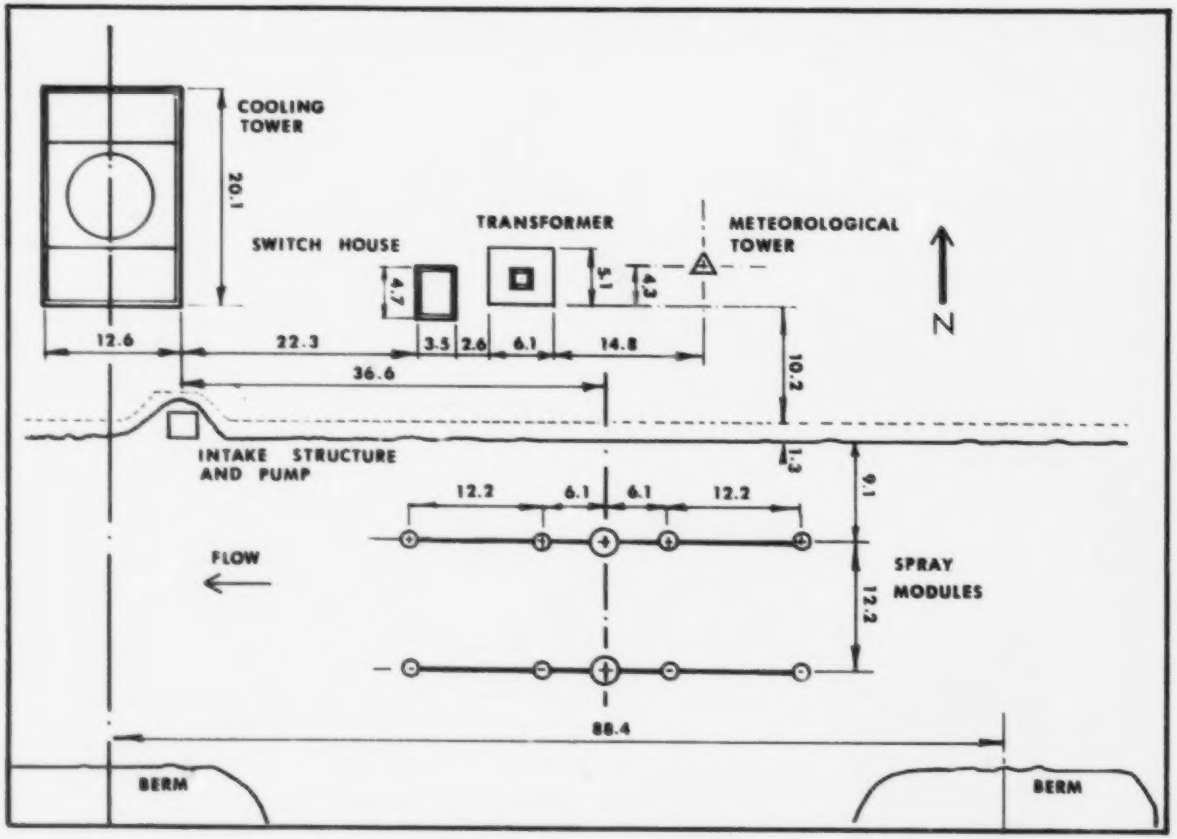

Figure 31. Cooling device site plan, Turkey Point, Florida. Dimensions in meters.

FORMAT FOR DATA PRESENTATION - SPRAY MODULE DRIFT EMISSION DATA

Note: For a more detailed description of the data format, see text Section VII "Data Format".

Table Headings

POSITION, d/θ/h	Gives the location of the instrument package relative to the operating spray modules. d is the displacement from the reference nozzle of the spray modules. The northwest nozzle was used for reference when the barge was in the canal west of the modules and the northeast nozzle was the reference point when the barge was east of the modules. θ indicates the angular location of the instrument package in positive degrees clockwise from magnetic north. h represents the height of the instrument package above the water line. Units are meters/degrees/meters.
DATE	Date on which the data were acquired.
TIME FRAME	Time interval for data acquisition period.

Column Headings

I	Integer number for droplet size ranges.
D(LOW)	The lower diameter of size range I, μm.
D (HI)	The upper diameter of size range I, μm.
DEL D	The width of the size range I, as determined by the difference between diameter D(HI) and D(LOW), μm.
D(CEN)	Center diameter of droplet size range I, μm.
P(D)	Particle density distribution; the number of droplets of diameter D within unit size range and unit volume of air, number/μm·m^3.
DEL X/DEL D	Drift mass density distribution; the mass of droplets of diameter D within unit size range and unit volume of air, μg/μm·m^3.
DEL X	Drift mass concentration; the drift mass due to droplets within a size range I per unit volume of air, μg/m^3.

DEL FLUX	Drift mass flux; the drift mass due to droplets within size range I which passes through a unit area per unit time, μg/m^2·s.
PARTICLE VEL	The horizontal component of the particle velocity, assumed for this application to be the same as the time mean wind speed, m/s.
X	Drift mass concentration; mass of droplets of all size ranges per unit volume of air; sum of all DEL X, μg/m^3.
DRIFT FLUX	Total drift mass flux; mass flux of all droplets of all size ranges; sum of all DEL FLUX, μg/m^2·s.
MASS MEDIAN DIAM	The droplet diameter at which half of the emitted mass is due to smaller droplets and half due to larger droplets, μm.

Barge Sampling Point Conditions

T_{wet}/T_{dry} Ranges	Extreme values for the wet and dry bulb temperatures of the air at the sampling point observed during the sampling period, °C.
Canal Water Temperature	Temperature of the canal water during the sampling period. If no information is entered here, it is not available.
Wind Speed and Wind Direction Distribution	The table shows the percentage of time during which the wind speed was in each velocity range and the percentage frequency during which the wind came from each direction.

Ambient Conditions

Wind Speed	Wind speed in km/hr.
Wind Direction	Direction from which the wind is blowing.
T_{wet}/T_{dry}	Wet and dry bulb temperatures of the ambient air, °C.

Note: Tabular data are presented in E format which designates scientific notation. Example: 5E 01 = 5×10^1

POSITION. d/θ/h(m/°/m): 20.7/280/4.3 DATE: 1/30/74 TIME FRAME: 1700-1800

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	2.000E 03	6.378E 00	1.676E 02	5.261E 02	3.140E 00
2	30.	50.	20.	40.	7.900E 02	2.647E 01	5.295E 02	1.663E 03	3.140E 00
3	50.	80.	30.	65.	4.000E 02	5.752E 01	1.726E 03	5.418E 03	3.140E 00
4	80.	110.	30.	95.	2.000E 02	8.978E 01	2.694E 03	8.459E 03	3.140E 00
5	110.	150.	40.	130.	7.900E 01	9.088E 01	3.635E 03	1.141E 04	3.140E 00
6	150.	200.	50.	175.	2.000E 01	5.612E 01	2.806E 03	8.811E 03	3.140E 00
7	200.	250.	50.	225.	3.500E 00	2.087E 01	1.044E 03	3.277E 03	3.140E 00
8	250.	300.	50.	275.	7.100E-01	7.731E 00	3.866E 02	1.214E 03	3.140E 00
9	300.	350.	50.	325.	1.600E-01	2.876E 00	1.438E 02	4.515E 02	3.140E 00
10	350.	400.	50.	375.	5.000E-02	1.381E 00	6.903E 01	2.168E 02	3.140E 00
11	400.	450.	50.	425.	2.000E-02	8.039E-01	4.019E 01	1.262E 02	3.140E 00
12	450.	500.	50.	475.	1.000E-02	5.612E-01	2.806E 01	8.810E 01	3.140E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (μm)
1.327E 04	4.166E 04	127

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 23.3 - 23.5/26.0 °C

Canal Water Temperature: 32.1 °C

Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 11.3 Km/hr ; Wind Direction: ESE ; T_{wet}/T_{dry} = 22.2/26.0 °C

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POSITION, d/θ/h(m/°/m): 36.6/270/4.3 **DATE:** 1/31/74 **TIME FRAME:** 1445-1545

NOTE: Concurrent IK Data Point Available: ____

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.300E 03	5.445E 00	1.089E 02	3.267E 02	3.000E 00
2	30.	50.	20.	40.	3.500E 02	1.173E 01	2.346E 02	7.037E 02	3.000E 00
3	50.	80.	30.	65.	1.600E 02	2.301E 01	6.902E 02	2.071E 03	3.000E 00
4	80.	110.	30.	95.	7.100E 01	3.187E 01	9.562E 02	2.869E 03	3.000E 00
5	110.	150.	40.	130.	2.500E 01	2.876E 01	1.150E 03	3.451E 03	3.000E 00
6	150.	200.	50.	175.	3.500E 00	9.822E 00	4.911E 02	1.473E 03	3.000E 00
7	200.	250.	50.	225.	5.000E-01	2.982E 00	1.491E 02	4.473E 02	3.000E 00
8	250.	300.	50.	275.	5.600E-02	6.098E-01	3.049E 01	9.147E 01	3.000E 00
9	300.	350.	50.	325.	1.000E-02	1.797E-01	8.987E 00	2.696E 01	3.000E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
3.820E 03	1.146E 04	108

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 22.3 - 23.0/26.3 - 27.0 °C

Canal Water Temperature: 32.7 °C
Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 10.8 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 22.2/26.6 °C

POSITION, d/θ/h(m/°/m): 36.6/270/4.3   DATE: 1/31/74   TIME FRAME: 1620-1720

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CENT) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	4.000E 03	1.675E 01	3.351E 02	1.240E 03	3.700E 00
2	30.	50.	20.	40.	7.100E 02	2.379E 01	4.758E 02	1.761E 03	3.700E 00
3	50.	80.	30.	65.	2.800E 02	4.026E 01	1.208E 03	4.469E 03	3.700E 00
4	80.	110.	30.	95.	1.400E 02	6.285E 01	1.885E 03	6.976E 03	3.700E 00
5	110.	150.	40.	130.	4.000E 01	4.601E 01	1.841E 03	6.810E 03	3.700E 00
6	150.	200.	50.	175.	5.000E 00	1.403E 01	7.015E 02	2.596E 03	3.700E 00
7	200.	250.	50.	225.	7.100E-01	4.235E 00	2.117E 02	7.834E 02	3.700E 00
8	250.	300.	50.	275.	1.300E-01	1.416E 00	7.079E 01	2.619E 02	3.700E 00
9	300.	350.	50.	325.	2.200E-02	3.954E-01	1.977E 01	7.315E 01	3.700E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
6.749E 03	2.497E 04	105

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 20.4 - 23.2/25.0 - 27.0 °C

Canal Water Temperature: 32.7 °C

Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 13.3 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 22.0/26.1 °C

POSITION. d/θ/h(m/°/m): 36.6/270/5.5 DATE: 1/31/74 TIME FRAME: 1730-1805

NOTE: Concurrent IK Data Point Available: _____

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PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.600E 03	6.702E 00	1.340E 02	5.630E 02	4.200E 00
2	30.	50.	20.	40.	5.000E 02	1.676E 01	3.351E 02	1.407E 03	4.200E 00
3	50.	80.	30.	65.	1.800E 02	2.588E 01	7.765E 02	3.261E 03	4.200E 00
4	80.	110.	30.	95.	6.300E 01	2.828E 01	8.485E 02	3.564E 03	4.200E 00
5	110.	150.	40.	130.	1.600E 01	1.841E 01	7.362E 02	3.092E 03	4.200E 00
6	150.	200.	50.	175.	1.600E 00	4.490E 00	2.245E 02	9.429E 02	4.200E 00
7	200.	250.	50.	225.	2.200E-01	1.312E 00	6.561E 01	2.755E 02	4.200E 00
8	250.	300.	50.	275.	3.200E-02	3.485E-01	1.742E 01	7.318E 01	4.200E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
3.138E 03	1.318E 04	91

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 22.5/26.0 °C

Canal Water Temperature: 32.7 °C

Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 15.1 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 22.0/26.1 °C

POSITION. d/θ/h(m/°/m): 36.6/270/5.5   DATE: 1/31/74   TIME FRAME: 1824-1840

NOTE: Concurrent IK Data Point Available: ____

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	3.500E 03	1.466E 01	2.932E 02	1.232E 03	4.200E 00
2	30.	50.	20.	40.	1.000E 03	3.351E 01	6.702E 02	2.815E 03	4.200E 00
3	50.	80.	30.	65.	3.200E 02	4.601E 01	1.380E 03	5.798E 03	4.200E 00
4	80.	110.	30.	95.	8.900E 01	3.995E 01	1.199E 03	5.034E 03	4.200E 00
5	110.	150.	40.	130.	1.330E 01	2.071E 01	8.283E 02	3.479E 03	4.200E 00
6	150.	200.	50.	175.	2.200E 00	6.174E 00	3.087E 02	1.296E 03	4.200E 00
7	200.	250.	50.	225.	4.000E-01	2.386E 00	1.193E 02	5.010E 02	4.200E 00
8	250.	300.	50.	275.	1.300E-01	1.089E 00	5.445E 01	2.287E 02	4.200E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
4.653E 03	2.038E 04	82

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 22.5/26.0 °C

Canal Water Temperature: 32.7 °C
Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 15.1 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 22.0/26.1 °C

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POSITION: d/θ/h(m/°/m) 36.6/270/4.3 **DATE:** 2/1/74 **TIME FRAME:** 1100-1130

NOTE: Concurrent IK Data Point Available: ____

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	2.000E 03	8.378E 00	1.676E 02	2.513E 02	1.500E 00
2	30.	50.	20.	40.	5.000E 02	1.676E 01	3.351E 02	5.027E 02	1.500E 00
3	50.	80.	30.	65.	1.600E 02	2.301E 01	6.902E 02	1.035E 03	1.500E 00
4	80.	110.	30.	95.	5.300E 01	2.828E 01	8.485E 02	1.273E 03	1.500E 00
5	110.	150.	40.	130.	2.200E 01	2.531E 01	1.012E 03	1.518E 03	1.500E 00
6	150.	200.	50.	175.	5.000E 00	1.403E 01	7.015E 02	1.052E 03	1.500E 00
7	200.	250.	50.	225.	1.100E 00	6.561E 00	3.280E 02	4.920E 02	1.500E 00
8	250.	300.	50.	275.	2.800E-01	3.049E 00	1.524E 02	2.287E 02	1.500E 00
9	300.	350.	50.	325.	5.300E-02	1.132E 00	5.662E 01	8.493E 01	1.500E 00
10	350.	400.	50.	375.	1.300E-02	3.590E-01	1.795E 01	2.692E 01	1.500E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
4.310E 03	6.465E 03	115

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 20.7-23.0/25.0-26.0°C

Canal Water Temperature: 33.0 °C
Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 5.4 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 21.9/26.8 °C

POSITION, d/θ/h(m/°/m): 36.6/270/4.3 DATE: 2/1/74 TIME FRAME: 1230-1332

NOTE: Concurrent IK Data Point Available: ____

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	2.000E 03	8.378E 00	1.676E 02	2.513E 02	1.500E 00
2	30.	50.	20.	40.	3.200E 02	1.072E 01	2.145E 02	3.217E 02	1.500E 00
3	50.	80.	30.	65.	1.000E 02	1.438E 01	4.314E 02	6.471E 02	1.500E 00
4	80.	110.	30.	95.	4.000E 01	1.796E 01	5.387E 02	8.081E 02	1.500E 00
5	110.	150.	40.	130.	1.300E 01	1.495E 01	5.982E 02	8.973E 02	1.500E 00
6	150.	200.	50.	175.	2.500E 00	7.015E 00	3.508E 02	5.262E 02	1.500E 00
7	200.	250.	50.	225.	5.000E-01	2.982E 00	1.491E 02	2.237E 02	1.500E 00
8	250.	300.	50.	275.	8.900E-02	9.691E-01	4.846E 01	7.269E 01	1.500E 00
9	300.	350.	50.	325.	1.600E-02	2.876E-01	1.438E 01	2.157E 01	1.500E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
2.513E 03	3.769E 03	105

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 20.7 - 23.0/25.0 - 26.0 °C

Canal Water Temperature: 33.0 °C

Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 5.4 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 21.9/26.8 °C

POSITION, d/θ/h(m/°/m): 36.6/270/6.1 DATE: 2/1/74 TIME FRAME: 1515-1545

NOTE: Concurrent IK Data Point Available: _____

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	2.000E 03	8.378E 00	1.676E 02	4.708E 02	2.810E 00
2	30.	50.	20.	40.	5.300E 02	2.111E 01	4.222E 02	1.186E 03	2.810E 00
3	50.	80.	30.	65.	2.200E 02	3.163E 01	9.490E 02	2.667E 03	2.810E 00
4	80.	110.	30.	95.	1.000E 02	4.489E 01	1.347E 03	3.784E 03	2.810E 00
5	110.	150.	40.	130.	2.500E 01	2.876E 01	1.150E 03	3.232E 03	2.810E 00
6	150.	200.	50.	175.	4.000E 00	1.122E 01	5.612E 02	1.577E 03	2.810E 00
7	200.	250.	50.	225.	5.000E-01	2.982E 00	1.491E 02	4.190E 02	2.810E 00
8	250.	300.	50.	275.	1.000E-01	1.089E 00	5.445E 01	1.530E 02	2.810E 00
9	300.	350.	50.	325.	2.800E-02	5.033E-01	2.516E 01	7.071E 01	2.810E 00
10	350.	400.	50.	375.	1.000E-02	2.761E-01	1.381E 01	3.879E 01	2.810E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
4.840E 03	1.260E 04	100

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 21.7 - 22.8/26.0 - 26.3 °C

Canal Water Temperature: 33.0 °C
Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 10.1 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 22.0/26.4 °C

POSITION, d/θ/h(m/°/m): 33.5/270/7.9 DATE: 2/1/74 TIME FRAME: 1645-1714

NOTE: Concurrent IK Data Point Available: ____

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	2.500E 03	1.047E 01	2.094E 02	6.283E 02	3.000E 00
2	30.	50.	20.	40.	8.900E 02	2.982E 01	5.965E 02	1.789E 03	3.000E 00
3	50.	80.	30.	65.	3.200E 02	4.601E 01	1.380E 03	4.141E 03	3.000E 00
4	80.	110.	30.	95.	1.100E 02	4.936E 01	1.481E 03	4.444E 03	3.000E 00
5	110.	150.	40.	130.	3.200E 01	3.681E 01	1.472E 03	4.417E 03	3.000E 00
6	150.	200.	50.	175.	2.500E 00	7.015E 00	3.508E 02	1.052E 03	3.000E 00
7	200.	250.	50.	225.	3.200E-01	1.909E 00	9.543E 01	2.863E 02	3.000E 00
8	250.	300.	50.	275.	7.100E-02	7.731E-01	3.866E 01	1.160E 02	3.000E 00
9	300.	350.	50.	325.	2.000E-02	3.595E-01	1.797E 01	5.392E 01	3.000E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
5.643E 03	1.693E 04	93

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 22.5 - 23.3/26.3 °C

Canal Water Temperature: 33.0 °C

Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 10.8 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 22.0/26.0 °C

POSITION, d/θ/h(m/°/m): 48.8/270/7.6 DATE: 2/1/74 TIME FRAME: 1725-1755

NOTE: Concurrent IK Data Point Available: _____

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	2.000E 03	8.378E 00	1.676E 02	7.540E 02	4.500E 00
2	30.	50.	20.	40.	4.500E 02	1.508E 01	3.016E 02	1.357E 03	4.500E 00
3	50.	80.	30.	65.	1.300E 02	1.869E 01	5.608E 02	2.524E 03	4.500E 00
4	80.	110.	30.	95.	3.500E 01	1.571E 01	4.714E 02	2.121E 03	4.500E 00
5	110.	150.	40.	130.	7.100E 00	8.167E 00	3.267E 02	1.470E 03	4.500E 00
6	150.	200.	50.	175.	7.100E-01	1.992E 00	9.962E 01	4.483E 02	4.500E 00
7	200.	250.	50.	225.	1.000E-01	5.964E-01	2.982E 01	1.342E 02	4.500E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
1.957E 03	8.809E 03	77

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 22.3/25.8 °C

Canal Water Temperature: 33.0 °C

Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 16.2 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 21.9/25.9 °C

POSITION, d/θ/h(m/°/m): 48.8/270/4.3 DATE: 2/1/74 TIME FRAME: 1805-1837

NOTE: Concurrent IK Data Point Available: ____

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.000E 03	4.189E 00	8.378E 01	4.189E 02	5.000E 00
2	30.	50.	20.	40.	2.800E 02	9.343E 00	1.877E 02	9.383E 02	5.000E 00
3	50.	80.	30.	65.	7.900E 01	1.136E 01	3.408E 02	1.704E 03	5.000E 00
4	80.	110.	30.	95.	2.500E 01	1.122E 01	3.367E 02	1.683E 03	5.000E 00
5	110.	150.	40.	130.	5.000E 00	5.752E 00	2.301E 02	1.150E 03	5.000E 00
6	150.	200.	50.	175.	2.800E-01	7.457E-01	3.929E 01	1.964E 02	5.000E 00
7	200.	250.	50.	225.	2.000E-02	1.193E-01	5.964E 00	2.982E 01	5.000E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
1.224E 03	6.121E 03	80

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 21.8 - 22.5/25.8 °C

Canal Water Temperature: 33.0 °C
Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 18.0 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 22.0/26.0 °C

POSITION. d/θ/h(m/°/m): 33.5/245/4.6 DATE: 2/12/74 TIME FRAME: 1552-1622

NOTE: Concurrent IK Data Point Available: ____

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	3.200E 03	1.340E 01	2.681E 02	6.702E 02	2.500E 00
2	30.	50.	20.	40.	5.000E 02	1.676E 01	3.351E 02	8.378E 02	2.500E 00
3	50.	80.	30.	65.	1.300E 02	1.869E 01	5.608E 02	1.402E 03	2.500E 00
4	80.	110.	30.	95.	2.600E 01	1.167E 01	3.502E 02	8.754E 02	2.500E 00
5	110.	150.	40.	130.	5.600E 00	6.442E 00	2.577E 02	6.442E 02	2.500E 00
6	150.	200.	50.	175.	6.300E-01	1.768E 00	8.839E 01	2.210E 02	2.500E 00
7	200.	250.	50.	225.	1.000E-01	5.964E-01	2.982E 01	7.455E 01	2.500E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
1.890E 03	4.725E 03	64

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 14.2 - 16.3/21.0 - 21.5 °C

Canal Water Temperature: °C

Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 9.0 Km/hr ; Wind Direction: NE ; T_{wet}/T_{dry} = 16.0/23.0 °C

POSITION. d/e/h(m/°/m): 64.0/245/4.6 DATE: 2/13/74 TIME FRAME: 1430 1600

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

N	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	5.000E 03	2.094E 01	4.189E 02	1.093E 03	2.610E 00
2	30.	50.	20.	40.	3.200E 02	1.072E 01	2.145E 02	5.598E 02	2.610E 00
3	50.	80.	30.	65.	1.000E 01	1.438E 00	4.314E 01	1.126E 02	2.610E 00
4	80.	110.	30.	95.	8.900E-01	3.995E-01	1.199E 01	3.128E 01	2.610E 00
5	110.	150.	40.	130.	1.300E-01	1.495E-01	5.982E 00	1.561E 01	2.610E 00
6	150.	200.	50.	175.	1.300E-02	3.648E-02	1.824E 00	4.761E 00	2.610E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
6.963E 02	1.817E 03	27

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 16.7 - 18.2/23.0 - 24.0 °C

Canal Water Temperature: °C
Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 9.4 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 16.6/23.3 °C

POSITION, d/θ/h(m/°/m): 41.1/270/4.6 DATE: 2/13/74 TIME FRAME: 1617-1700

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	3.200E 02	1.340E 00	2.681E 01	8.043E 01	3.000E 00
2	30.	50.	20.	40.	1.400E 02	4.691E 00	9.383E 01	2.815E 02	3.000E 00
3	50.	80.	30.	65.	7.100E 01	1.021E 01	3.063E 02	9.188E 02	3.000E 00
4	80.	110.	30.	95.	2.500E 01	1.122E 01	3.367E 02	1.010E 03	3.000E 00
5	110.	150.	40.	130.	6.300E 00	7.247E 00	2.899E 02	8.697E 02	3.000E 00
6	150.	200.	50.	175.	1.000E 00	2.806E 00	1.403E 02	4.209E 02	3.000E 00
7	200.	250.	50.	225.	1.600E-01	9.543E-01	4.771E 01	1.431E 02	3.000E 00
8	250.	300.	50.	275.	2.500E-02	2.722E-01	1.361E 01	4.083E 01	3.000E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
1.255E 03	3.765E 03	98

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 15.5 - 18.2/22.0 - 23.0 °C

Canal Water Temperature: °C

Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 10.8 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 17.0/23.3 °C

POSITION, d/θ/h(m/°/m): 41.1/270/7.0 DATE: 2/13/74 TIME FRAME: 1725-1756

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(LEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.630E 03	6.702E 00	1.340E 02	3.351E 02	2.500E 00
2	30.	50.	20.	40.	2.500E 02	8.378E 00	1.676E 02	4.189E 02	2.500E 00
3	50.	80.	30.	65.	7.100E 01	1.021E 01	3.063E 02	7.657E 02	2.500E 00
4	80.	110.	30.	95.	2.300E 01	8.980E 00	2.694E 02	6.734E 02	2.500E 00
5	110.	150.	40.	130.	4.500E 00	5.177E 00	2.071E 02	5.177E 02	2.500E 00
6	150.	200.	50.	175.	6.300E-01	1.768E 00	8.839E 01	2.210E 02	2.500E 00
7	200.	250.	50.	225.	5.600E-02	3.340E-01	1.670E 01	4.175E 01	2.500E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
1.189E 03	2.973E 03	79

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 17.0/22.5 °C

Canal Water Temperature: °C

Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 9.0 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 17.0/23.3 °C

POSITION. d/θ/h(m/°/m): 38.1/270/2.4 DATE: 2/13/74 TIME FRAME: 1810-1840

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.600E 03	6.702E 00	1.340E 02	3.351E 02	2.500E 00
2	30.	50.	20.	40.	3.200E 02	1.072E 01	2.145E 02	5.362E 02	2.500E 00
3	50.	80.	30.	65.	6.300E 01	9.059E 00	2.718E 02	6.794E 02	2.500E 00
4	80.	110.	30.	95.	1.600E 01	7.183E 00	2.155E 02	5.387E 02	2.500E 00
5	110.	150.	40.	130.	3.200E 00	3.681E 00	1.472E 02	3.681E 02	2.500E 00
6	150.	200.	50.	175.	2.600E-01	7.857E-01	3.929E 01	9.822E 01	2.500E 00
7	200.	250.	50.	225.	2.600E-02	1.670E-01	8.350E 00	2.087E 01	2.500E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
1.031E 03	2.577E 03	68

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 17.0 - 18.0/22.5 - 23 °C

Canal Water Temperature: °C
Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 9.0 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 17.0/23.3 °C

POSITION, d/θ/h(m/°/m): 88.4/245/4.6 DATE: 2/14/74 TIME FRAME: 1637-1918

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	7.100E 02	2.974E 00	5.948E 01	2.016E 02	3.390E 00
2	30.	50.	20.	40.	5.600E 01	1.877E 00	3.753E 01	1.272E 02	3.390E 00
3	50.	80.	30.	65.	7.900E 00	1.136E 00	3.408E 01	1.155E 02	3.390E 00
4	80.	110.	30.	95.	1.600E 00	7.183E-01	2.155E 01	7.305E 01	3.390E 00
5	110.	150.	40.	130.	4.000E-01	4.601E-01	1.841E 01	6.239E 01	3.390E 00
6	150.	200.	50.	175.	3.500E-02	9.822E-02	4.911E 00	1.665E 01	3.390E 00
7	200.	250.	50.	225.	2.200E-03	1.312E-02	6.561E-01	2.224E 00	3.390E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
1.766E 02	5.987E 02	46

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 16.7 - 18.9/23.0 - 23.9 °C

Canal Water Temperature: °C

Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 12.2 Km/hr ; Wind Direction: NE ; T_{wet}/T_{dry} = 18.0/24.5 °C

POSITION. d/θ/h(m/°/m): 33.5/270/4.6 DATE: 2/15/74 TIME FRAME: 1359-1656

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(I) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.000E 03	4.189E 00	8.378E 01	2.513E 02	3.000E 00
2	30.	50.	20.	40.	2.500E 02	8.378E 00	1.676E 02	5.027E 02	3.000E 00
3	50.	80.	30.	65.	4.000E 01	5.752E 00	1.726E 02	5.177E 02	3.000E 00
4	80.	110.	30.	95.	4.000E 00	1.796E 00	5.387E 01	1.616E 02	3.000E 00
5	110.	150.	40.	130.	4.000E-01	4.601E-01	1.841E 01	5.522E 01	3.000E 00
6	150.	200.	50.	175.	8.900E-02	2.497E-01	1.249E 01	3.746E 01	3.000E 00
7	200.	250.	50.	225.	1.600E-02	9.543E-02	4.771E 00	1.431E 01	3.000E 00
8	250.	300.	50.	275.	4.000E-03	4.356E-02	2.178E 00	6.534E 00	3.000E 00
9	300.	350.	50.	325.	1.300E-03	2.337E-02	1.168E 00	3.505E 00	3.000E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
5.168E 02	1.550E 03	51

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 18.7 - 23.0/24.0 - 26.0 °C

Canal Water Temperature: °C

Wind Speed and Direction Distribution: See Table

AMBIENT CONDITIONS: Wind Speed: 10.8 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 21.0/25.5 °C

POSITION. d/θ/h(m/°/m): 36.6/230/4.6 DATE: 3/18/74 TIME FRAME: 1459-1559

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	2.500E 03	1.047E 01	2.094E 02	5.885E 02	2.810E 00
2	30.	50.	20.	40.	6.300E 02	2.111E 01	4.222E 02	1.186E 03	2.810E 00
3	50.	80.	30.	65.	2.200E 02	3.163E 01	9.490E 02	2.667E 03	2.810E 00
4	80.	110.	30.	95.	6.300E 01	2.828E 01	8.485E 02	2.384E 03	2.810E 00
5	110.	150.	40.	130.	1.600E 01	1.841E 01	7.362E 02	2.069E 03	2.810E 00
6	150.	200.	50.	175.	2.500E 00	7.015E 00	3.508E 02	9.857E 02	2.810E 00
7	200.	250.	50.	225.	3.200E-01	1.909E 00	9.543E 01	2.681E 02	2.810E 00
8	250.	300.	50.	275.	5.000E-02	5.445E-01	2.722E 01	7.650E 01	2.810E 00
9	300.	350.	50.	325.	8.900E-03	1.600E-01	7.999E 00	2.248E 01	2.810E 00
10	350.	400.	50.	375.	1.800E-03	4.973E-02	2.485E 00	6.983E 00	2.810E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
3.649E 03	1.025E 04	89

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 18.5 - 20.6/22.5 - 24.0 °C

Canal Water Temperature: 34.5 °C

Wind Speed and Direction Distribution: See Table 9

AMBIENT CONDITIONS: Wind Speed: 10.1 Km/hr ; Wind Direction: NE ; T_{wet}/T_{dry} = 19.4/24.6 °C

POSITION, d/θ/h(m/°/m): 36.6/230/11.0 DATE: 3/18/74 TIME FRAME: 1653-1723

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	3.200E 02	1.340E 00	2.681E 01	1.206E 02	4.500E 00
2	30.	50.	20.	40.	5.000E 01	1.676E 00	3.351E 01	1.508E 02	4.500E 00
3	50.	80.	30.	65.	1.400E 01	2.013E 00	6.039E 01	2.718E 02	4.500E 00
4	80.	110.	30.	95.	3.500E 00	1.571E 00	4.714E 01	2.121E 02	4.500E 00
5	110.	150.	40.	130.	7.900E-01	9.088E-01	3.635E 01	1.636E 02	4.500E 00
6	150.	200.	50.	175.	1.400E-01	3.929E-01	1.964E 01	8.839E 01	4.500E 00
7	200.	250.	50.	225.	2.000E-02	1.193E-01	5.964E 00	2.684E 01	4.500E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
2.298E 02	1.034E 03	77

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 16.6 - 18.9/22.2 - 23.3 °C

Canal Water Temperature: 34.5°C
Wind Speed and Direction Distribution: See Table 10

AMBIENT CONDITIONS: Wind Speed: 16.2 Km/hr ; Wind Direction: NE ; T_{wet}/T_{dry} = 18.1/24.2 °C

POSITION, d/θ/h(m/°/m): 36.6/230/7.6 DATE: 3/18/74 TIME FRAME: 1743-1843

NOTE: Concurrent IK Data Point Available: X

PIL'S AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CENT) (UM)	F(D) (#/UM-M2)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.000E 03	4.189E 00	8.378E 01	4.030E 02	4.810E 00
2	30.	50.	20.	40.	2.000E 02	6.702E 00	1.340E 02	6.447E 02	4.810E 00
3	50.	80.	30.	65.	4.500E 01	6.471E 00	1.941E 02	9.337E 02	4.810E 00
4	80.	110.	30.	95.	7.900E 00	3.546E 00	1.064E 02	5.118E 02	4.810E 00
5	110.	150.	40.	130.	1.300E 00	1.495E 00	5.982E 01	2.877E 02	4.810E 00
6	150.	200.	50.	175.	2.000E-01	5.612E-01	2.806E 01	1.350E 02	4.810E 00
7	200.	250.	50.	225.	3.200E-02	1.909E-01	9.543E 00	4.590E 01	4.810E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
6.158E 02	2.962E 03	64

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 17.5 - 19.0/22.8 - 23.3

Canal Water Temperature: 34.5°C

Wind Speed and Direction Distribution: See Table 11

AMBIENT CONDITIONS: Wind Speed: 17.3 Km/hr ; Wind Direction: NE ; T_{wet}/T_{dry} = 17.6/23.6 °C

POSITION. d/θ/h(m/°/m): 36.6/290/4.6 DATE: 3/19/74 TIME FRAME: 1122-1222

NOTE: Concurrent IK Data Point Available: x

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.600E 04	6.702E 00	1.340E 02	6.702E 02	5.000E 00
2	30.	50.	20.	40.	3.530E 02	1.173E 01	2.346E 02	1.173E 03	5.000E 00
3	50.	60.	30.	65.	1.000E 02	1.438E 01	4.314E 02	2.157E 03	5.000E 00
4	80.	110.	30.	95.	2.800E 01	1.257E 01	3.771E 02	1.885E 03	5.000E 00
5	110.	150.	40.	130.	6.300E 00	7.247E 00	2.899E 02	1.449E 03	5.000E 00
6	150.	200.	50.	175.	1.300E 00	2.806E 00	1.403E 02	7.015E 02	5.000E 00
7	200.	250.	50.	225.	1.400E-01	8.350E-01	4.175E 01	2.087E 02	5.000E 00
8	250.	300.	50.	275.	2.500E-02	2.722E-01	1.361E 01	6.806E 01	5.000E 00
9	300.	350.	50.	325.	5.000E-03	8.987E-02	4.494E 00	2.247E 01	5.000E 00
10	350.	400.	50.	375.	1.100E-03	3.037E-02	1.519E 00	7.593E 00	5.000E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
1.669E 03	8.343E 03	83

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 19.7 - 21.3/24.3 - 24.5 °C

Canal Water Temperature: 32.7°C
Wind Speed and Direction Distribution: See Table 12

AMBIENT CONDITIONS: Wind Speed: 18.0 Km/hr ; Wind Direction: SE ; T_{wet}/T_{dry} = 21.0/26.0 °C

POSITION, d/e/h(m/°/m): 36.6/290/4.6 DATE: 3/26/74 TIME FRAME: 1104-1148

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	DI(LOW) (UM)	DI(HI) (UM)	DEL D (UM)	DI(CEN) (UM)	P(I) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	6.300E 03	2.639E 01	5.278E 02	2.111E 03	4.000E 00
2	30.	50.	20.	40.	1.400E 03	4.691E 01	9.383E 02	3.753E 03	4.000E 00
3	50.	80.	30.	65.	4.000E 02	5.752E 01	1.726E 03	6.904E 03	4.000E 00
4	80.	110.	30.	95.	1.400E 02	6.285E 01	1.885E 03	7.542E 03	4.000E 00
5	110.	150.	40.	130.	4.500E 01	5.177E 01	2.071E 03	8.283E 03	4.000E 00
6	150.	200.	50.	175.	7.900E 00	2.217E 01	1.108E 03	4.434E 03	4.000E 00
7	200.	250.	50.	225.	1.000E 00	5.964E 00	2.982E 02	1.193E 03	4.000E 00
8	250.	300.	50.	275.	1.400E-01	1.524E 00	7.622E 01	3.049E 02	4.000E 00
9	300.	350.	50.	325.	2.000E-02	3.595E-01	1.797E 01	7.190E 01	4.000E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
8.649E 03	3.459E 04	92

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 24.7 - 26.8/27.7 - 28.8 °C

Canal Water Temperature: 36.8°C
Wind Speed and Direction Distribution: See Table 13

AMBIENT CONDITIONS: Wind Speed: 14.4 Km/hr ; Wind Direction: SE ; T_{wet}/T_{dry} = 24.9/28.0 °C

POSITION. d/θ/h(m/°/m): 35.6/290/3.0 DATE: 3/26/74 TIME FRAME: 1200-1248

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CENT) (UM)	N(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	5.330E 03	2.094E 01	4.189E 02	1.257E 03	3.000E 00
2	30.	50.	20.	40.	1.630E 03	5.362E 01	1.072E 03	3.217E 03	3.000E 00
3	50.	80.	30.	65.	5.630E 02	8.052E 01	2.416E 03	7.248E 03	3.000E 00
4	80.	110.	30.	95.	2.330E 02	8.978E 01	2.694E 03	8.081E 03	3.000E 00
5	110.	150.	40.	130.	6.430E 01	7.247E 01	2.899E 03	8.697E 03	3.000E 00
6	150.	200.	50.	175.	1.300E 01	5.051E 01	2.526E 03	7.577E 03	3.000E 00
7	200.	250.	50.	225.	4.300E 00	2.386E 01	1.193E 03	3.578E 03	3.000E 00
8	250.	300.	50.	275.	6.300E-01	6.860E 00	3.430E 02	1.029E 03	3.000E 00
9	300.	350.	50.	325.	1.330E-01	1.797E 00	8.987E 01	2.696E 02	3.000E 00
10	350.	400.	50.	375.	1.400E-02	4.970E-01	2.485E 01	7.455E 01	3.000E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
1.368E 04	4.103E 04	113

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 24.5 - 26.6/27.8 - 28.4 °C

Canal Water Temperature: 36.8°C
Wind Speed and Direction Distribution: See Table 14

AMBIENT CONDITIONS: Wind Speed: 10.8 Km/hr ; Wind Direction: SE ; T_{wet}/T_{dry} = 24.5/28.0 °C

POSITION, d/θ/h(m/°/m): 36.6/290/6.1 DATE: 3/26/74 TIME FRAME: 1255-1339

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(I) (UM)	D(I+1) (UM)	DEL D (UM)	D(CEN) (UM)	N(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	2.500E 03	1.047E 01	2.094E 02	7.330E 02	3.500E 00
2	30.	50.	20.	40.	5.500E 02	1.877E 01	3.755E 02	1.314E 03	3.500E 00
3	50.	80.	30.	65.	1.830E 02	2.588E 01	7.765E 02	2.718E 03	3.500E 00
4	80.	110.	30.	95.	5.600E 01	2.514E 01	7.542E 02	2.640E 03	3.500E 00
5	110.	150.	40.	130.	2.030E 01	2.301E 01	9.203E 02	3.221E 03	3.500E 00
6	150.	200.	50.	175.	4.533E 00	1.263E 01	6.314E 02	2.210E 03	3.500E 00
7	200.	250.	50.	225.	7.100E-01	4.235E 00	2.117E 02	7.410E 02	3.500E 00
8	250.	300.	50.	275.	8.930E-02	9.691E-01	4.846E 01	1.696E 02	3.500E 00
9	300.	350.	50.	325.	1.600E-02	2.876E-01	1.438E 01	5.033E 01	3.500E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
3.942E 03	1.380E 04	104

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 22.5 - 24.5/26.2 - 27.0 °C

Canal Water Temperature: 36.8°C
Wind Speed and Direction Distribution: See Table 15

AMBIENT CONDITIONS: Wind Speed: 12.6 Km/hr ; Wind Direction: SE ; T_{wet}/T_{dry} = 24.5/28.0 °C

POSITION. d/θ/h(m/°/m): 36.6/290/9.1 DATE: 3/26/74 TIME FRAME: 1352-1440

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	3.200E 02	1.340E 00	2.681E 01	1.123E 02	4.190E 00
2	30.	50.	20.	40.	1.100E 02	3.686E 00	7.372E 01	3.089E 02	4.190E 00
3	50.	80.	30.	65.	4.000E 01	5.752E 00	1.726E 02	7.230E 02	4.190E 00
4	80.	110.	30.	95.	1.300E 01	5.836E 00	1.751E 02	7.336E 02	4.190E 00
5	110.	150.	40.	130.	3.500E 00	4.026E 00	1.610E 02	6.748E 02	4.190E 00
6	150.	200.	50.	175.	6.300E-01	1.768E 00	8.839E 01	3.704E 02	4.190E 00
7	200.	250.	50.	225.	8.900E-02	5.308E-01	2.654E 01	1.112E 02	4.190E 00
8	250.	300.	50.	275.	1.100E-02	1.198E-01	5.989E 00	2.509E 01	4.190E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
7.301E 02	3.059E 03	96

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 23.2 - 25.0/27.0 - 27.8 °C

Canal Water Temperature: 36.8°C
Wind Speed and Direction Distribution: See Table 16

AMBIENT CONDITIONS: Wind Speed: 15.1 Km/hr ; Wind Direction: SE ; T_{wet}/T_{dry} = 24.0/27.4 °C

POSITION, d/θ/h(m/°/m): 36.6/275/4.6 DATE: 3/27/74 TIME FRAME: 1542-1627

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	2.000E 03	8.378E 00	1.676E 02	4.842E 02	2.890E 00
2	30.	50.	20.	40.	7.100E 02	2.379E 01	4.758E 02	1.375E 03	2.890E 00
3	50.	80.	30.	65.	2.530E 02	3.595E 01	1.078E 03	3.117E 03	2.890E 00
4	80.	110.	30.	95.	8.900E 01	3.995E 01	1.199E 03	3.464E 03	2.890E 00
5	110.	150.	40.	130.	2.300E 01	3.221E 01	1.288E 03	3.723E 03	2.890E 00
6	150.	200.	50.	175.	5.000E 00	1.403E 01	7.015E 02	2.027E 03	2.890E 00
7	200.	250.	50.	225.	5.000E-01	2.932E 00	1.491E 02	4.309E 02	2.890E 00
8	250.	300.	50.	275.	7.100E-02	7.731E-01	3.866E 01	1.117E 02	2.890E 00
9	300.	350.	50.	325.	1.000E-02	1.797E-01	8.987E 00	2.597E 01	2.890E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
5.107E 03	1.475E 04	101

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BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 23.7 - 25.3/27.0 - 28.0 °C

Canal Water Temperature: 34.8°C

Wind Speed and Direction Distribution: See Table 17

AMBIENT CONDITIONS: Wind Speed: 10.4 Km/hr ; Wind Direction: ESE ; T_{wet}/T_{dry} = 23.2/27.8 °C

POSITION, d/θ/h(m/°/m): 73.2/280/4.6 DATE: 3/27/74 TIME FRAME: 1652-1740

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NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	7.900E 02	3.309E 00	6.618E 01	1.780E 02	2.690E 00
2	30.	50.	20.	40.	1.500E 02	5.362E 00	1.072E 02	2.885E 02	2.690E 00
3	50.	90.	30.	65.	3.500E 01	5.033E 00	1.510E 02	4.061E 02	2.690E 00
4	90.	110.	30.	95.	1.000E 01	4.489E 00	1.347E 02	3.623E 02	2.690E 00
5	110.	150.	40.	130.	2.000E 00	2.301E 00	9.203E 01	2.476E 02	2.690E 00
6	150.	200.	50.	175.	2.800E-01	7.857E-01	3.929E 01	1.057E 02	2.690E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
5.904E 02	1.588E 03	71

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 22.0 - 23.5/26.0 - 27.0 °C

Canal Water Temperature: 34.8 °C
Wind Speed and Direction Distribution: See Table 18

AMBIENT CONDITIONS: Wind Speed: 9.7 Km/hr ; Wind Direction: ESE ; T_{wet}/T_{dry} = 23.5/27.5 °C

POSITION, d/θ/h(m/°/m): 73.2/280/7.6 · DATE: 3/27/74 TIME FRAME: 1801-1830

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	5.000E 02	2.094E 00	4.189E 01	1.177E 02	2.810E 00
2	30.	50.	20.	40.	1.000E 02	3.351E 00	6.702E 01	1.883E 02	2.810E 00
3	50.	80.	30.	65.	2.200E 01	3.163E 00	9.490E 01	2.667E 02	2.810E 00
4	80.	110.	30.	95.	5.000E 00	2.245E 00	6.734E 01	1.892E 02	2.810E 00
5	110.	150.	40.	130.	1.400E 00	1.610E 00	6.442E 01	1.810E 02	2.810E 00
6	150.	200.	50.	175.	2.000E-01	5.612E-01	2.806E 01	7.885E 01	2.810E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
3.636E 02	1.022E 03	73

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 24.1/26.0 °C

Canal Water Temperature: 34.8°C
Wind Speed and Direction Distribution: See Table 19

AMBIENT CONDITIONS: Wind Speed: 10.1 Km/hr ; Wind Direction: ESE ; T_{wet}/T_{dry} = 23.7/26.5 °C

POSITION, d/θ/h(m/°/m): 36.6/060/4.6 DATE: 3/30/74 TIME FRAME: 1540-1625

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	3.200E 03	1.340E 01	2.681E 02	1.289E 03	4.810E 00
2	30.	50.	20.	40.	7.900E 02	2.647E 01	5.295E 02	2.547E 03	4.810E 00
3	50.	80.	30.	65.	3.200E 02	4.601E 01	1.380E 03	6.640E 03	4.810E 00
4	80.	110.	30.	95.	1.800E 02	8.081E 01	2.424E 03	1.166E 04	4.810E 00
5	110.	150.	40.	130.	7.900E 01	9.088E 01	3.635E 03	1.748E 04	4.810E 00
6	150.	200.	50.	175.	2.500E 01	7.015E 01	3.508E 03	1.687E 04	4.810E 00
7	200.	250.	50.	225.	7.100E 00	4.235E 01	2.117E 03	1.018E 04	4.810E 00
8	250.	300.	50.	275.	1.600E 00	1.960E 01	9.800E 02	4.714E 03	4.810E 00
9	300.	350.	50.	325.	4.000E-01	7.190E 00	3.595E 02	1.729E 03	4.810E 00
10	350.	400.	50.	375.	7.900E-02	2.181E 00	1.091E 02	5.246E 02	4.810E 00
11	400.	450.	50.	425.	1.800E-02	7.235E-01	3.618E 01	1.740E 02	4.810E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
1.535E 04	7.382E 04	144

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 24.0 - 26.7/28.8 - 29.3 °C

Canal Water Temperature: 33.4°C
Wind Speed and Direction Distribution: See Table 20

AMBIENT CONDITIONS: Wind Speed: 17.3 Km/hr ; Wind Direction: SW ; T_{wet}/T_{dry} = 22.0/28.5 °C

POSITION. d/θ/h(m/°/m): 73.2/070/7.6 DATE: 3/30/74 TIME FRAME: 1640-1740

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	2.500E 02	1.047E 00	2.094E 01	1.227E 02	5.860E 00
2	30.	50.	20.	40.	1.000E 02	3.351E 00	6.702E 01	3.927E 02	5.860E 00
3	50.	80.	30.	65.	4.500E 01	6.471E 00	1.941E 02	1.138E 03	5.860E 00
4	80.	110.	30.	95.	2.000E 01	8.978E 00	2.694E 02	1.578E 03	5.860E 00
5	110.	150.	40.	130.	6.300E 00	7.247E 00	2.899E 02	1.699E 03	5.860E 00
6	150.	200.	50.	175.	1.400E 00	3.929E 00	1.964E 02	1.151E 03	5.860E 00
7	200.	250.	50.	225.	2.800E-01	1.670E 00	8.350E 01	4.893E 02	5.860E 00
8	250.	300.	50.	275.	4.000E-02	4.356E-01	2.178E 01	1.276E 02	5.860E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
1.143E 03	6.698E 03	113

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 23.7 - 25.1/29.0 - 30.0 °C

Canal Water Temperature: 33.4°C
Wind Speed and Direction Distribution: See Table 21

AMBIENT CONDITIONS: Wind Speed: 21.1 Km/hr ; Wind Direction: SW ; T_{wet}/T_{dry} = 22.0/28.5 °C

POSITION. d/θ/h(m/°/m): 73.2/070/11.0 DATE: 3/30/74 TIME FRAME: 1755 - 1855

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	3.200E 02	1.340E 00	2.681E 01	1.877E 02	7.000E 00
2	30.	50.	20.	40.	4.900E 01	2.982E 00	5.965E 01	4.175E 02	7.000E 00
3	50.	80.	30.	65.	2.900E 01	4.026E 00	1.208E 02	8.455E 02	7.000E 00
4	80.	110.	30.	95.	1.100E 01	4.938E 00	1.481E 02	1.037E 03	7.000E 00
5	110.	150.	40.	130.	4.000E 00	4.601E 00	1.841E 02	1.288E 03	7.000E 00
6	150.	200.	50.	175.	6.300E-01	1.768E 00	8.839E 01	6.188E 02	7.000E 00
7	200.	250.	50.	225.	1.100E-01	6.561E-01	3.280E 01	2.296E 02	7.000E 00
8	250.	300.	50.	275.	2.000E-02	2.178E-01	1.089E 01	7.622E 01	7.000E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
6.715E 02	4.701E 03	106

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 22.7 - 25.4/28.2 - 29.0 °C

Canal Water Temperature: 33.4°C
Wind Speed and Direction Distribution: See Table 22

AMBIENT CONDITIONS: Wind Speed: 25.3 Km/hr ; Wind Direction: SW ; T_{wet}/T_{dry} = 22.0/28.5 °C

POSITION. d/θ/h(m/°/m): 73.2/070/4.6 DATE: 3/30/74 TIME FRAME: 1905-1935

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	6.300E 02	2.639E 00	5.278E 01	3.003E 02	5.690E 00
2	30.	50.	20.	40.	1.400E 02	4.691E 00	9.383E 01	5.339E 02	5.690E 00
3	50.	80.	30.	65.	4.000E 01	5.752E 00	1.726E 02	9.818E 02	5.690E 00
4	80.	110.	30.	95.	1.300E 01	5.835E 00	1.751E 02	9.962E 02	5.690E 00
5	110.	150.	40.	130.	4.000E 00	4.601E 00	1.841E 02	1.047E 03	5.690E 00
6	150.	200.	50.	175.	7.900E-01	2.217E 00	1.108E 02	6.307E 02	5.690E 00
7	200.	250.	50.	225.	1.100E-01	6.561E-01	3.280E 01	1.866E 02	5.690E 00
8	250.	300.	50.	275.	1.800E-02	1.960E-01	9.800E 00	5.576E 01	5.690E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
8.317E 02	4.733E 03	97

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 24.0/28.9 °C

Canal Water Temperature: 33.4 °C

Wind Speed and Direction Distribution: See Table 23

AMBIENT CONDITIONS: Wind Speed: 20.5 Km/hr ; Wind Direction: SW ; T_{wet}/T_{dry} = 23.0/28.9 °C

POSITION. d/θ/h(m/°/m): 36.6/260/4.6 DATE: 3/31/74 TIME FRAME: 1240-1325

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.000E 03	4.189E 00	8.378E 01	2.254E 02	2.690E 00
2	30.	50.	20.	40.	3.200E 02	1.072E 01	2.145E 02	5.769E 02	2.690E 00
3	50.	80.	30.	65.	1.400E 02	2.013E 01	6.039E 02	1.625E 03	2.690E 00
4	80.	110.	30.	95.	5.000E 01	2.245E 01	6.734E 02	1.811E 03	2.690E 00
5	110.	150.	40.	130.	1.600E 01	1.841E 01	7.362E 02	1.980E 03	2.690E 00
6	150.	200.	50.	175.	2.800E 00	7.857E 00	3.929E 02	1.057E 03	2.690E 00
7	200.	250.	50.	225.	2.500E-01	2.087E 00	1.044E 02	2.808E 02	2.690E 00
8	250.	300.	50.	275.	2.500E-02	3.811E-01	1.906E 01	5.126E 01	2.690E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
2.828E 03	7.609E 03	103

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 24.0 - 27.1/28.0 - 30.1 °C

Canal Water Temperature: 34.9 °C

Wind Speed and Direction Distribution: See Table 24

AMBIENT CONDITIONS: Wind Speed: 9.7 Km/hr ; Wind Direction: ENE ; T_{wet}/T_{dry} = 22.0/28.5 °C

POSITION, d/θ/h(m/°/m): 33.5/295/4.6 DATE: 3/31/74 TIME FRAME: 1345-1428

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.000E 03	4.189E 00	8.378E 01	3.929E 02	4.690E 00
2	30.	50.	20.	40.	3.200E 02	1.072E 01	2.145E 02	1.006E 03	4.690E 00
3	50.	80.	30.	65.	1.100E 02	1.582E 01	4.745E 02	2.225E 03	4.690E 00
4	80.	110.	30.	95.	4.000E 01	1.796E 01	5.387E 02	2.527E 03	4.690E 00
5	110.	150.	40.	130.	1.300E 01	1.495E 01	5.982E 02	2.805E 03	4.690E 00
6	150.	200.	50.	175.	2.000E 00	5.612E 00	2.806E 02	1.316E 03	4.690E 00
7	200.	250.	50.	225.	2.000E-01	1.193E 00	5.964E 01	2.797E 02	4.690E 00
8	250.	300.	50.	275.	1.800E-02	1.960E-01	9.800E 00	4.596E 01	4.690E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
2.260E 03	1.060E 04	100

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 24.4 - 27.4/29.1 - 30.8 °C

Canal Water Temperature: 34.9°C

Wind Speed and Direction Distribution: See Table 25

AMBIENT CONDITIONS: Wind Speed: 16.9 Km/hr ; Wind Direction: ESE ; T_{wet}/T_{dry} = 22.5/27.8 °C

POSITION, d/θ/h(m/°/m): 36.6/245/4.6 DATE: 3/31/74 TIME FRAME: 1441-1524

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	3.200E 02	1.340E 00	2.681F 01	1.356E 02	5.060E 00
2	30.	50.	20.	40.	1.100F 02	3.686E 00	7.372E 01	3.730E 02	5.060E 00
3	50.	80.	30.	65.	4.000E 01	5.752E 00	1.726E 02	8.731E 02	5.060E 00
4	80.	110.	30.	95.	1.100F 01	4.938E 00	1.481E 02	7.496E 02	5.060E 00
5	110.	150.	40.	130.	1.800E 00	2.071E 00	8.283E 01	4.191F 02	5.060E 00
6	150.	200.	50.	175.	2.000E-01	5.612E-01	2.806E 01	1.420E 02	5.060E 00
7	200.	250.	50.	225.	3.500F-02	2.087E-01	1.044F 01	5.281F 01	5.060E 00
8	250.	300.	50.	275.	3.900E-03	9.691E-02	4.846E 00	2.452E 01	5.060E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
5.474E 02	2.770E 03	80

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 23.1/28.9 °C

Canal Water Temperature: 34.9°C
Wind Speed and Direction Distribution: See Table 26

AMBIENT CONDITIONS: Wind Speed: 18.2 Km/hr ; Wind Direction: ESE ; T_{wet}/T_{dry} = 22.5/27.8 °C

POSITION, d/θ/h(m/°/m) : 33.5/270/4.6 DATE: 3/31/74 TIME FRAME: 1538-1622

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	5.000E 02	2.094E 00	4.189E 01	1.860E 02	4.440E 00
2	30.	50.	20.	40.	2.500E 02	8.378E 00	1.676E 02	7.439E 02	4.440E 00
3	50.	80.	30.	65.	1.300E 02	1.869E 01	5.608E 02	2.490E 03	4.440E 00
4	80.	110.	30.	95.	5.000E 01	2.245E 01	6.734E 02	2.990E 03	4.440E 00
5	110.	150.	40.	130.	1.300E 01	1.495E 01	5.982E 02	2.656E 03	4.440E 00
6	150.	200.	50.	175.	1.800E 00	5.051E 00	2.526E 02	1.121E 03	4.440E 00
7	200.	250.	50.	225.	2.200E-01	1.312E 00	6.561E 01	2.913E 02	4.440E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
2.360E 03	1.048E 04	98

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 20.5 - 25.5/27.5-29.8 °C

Canal Water Temperature: 34.9°C
Wind Speed and Direction Distribution: See Table 27

AMBIENT CONDITIONS: Wind Speed: 16.0 Km/hr ; Wind Direction: E ; T_{wet}/T_{dry} = 21.0/27.9 °C

POSITION. d/θ/h(m/°/m): 36.6/280/7.6 DATE: 3/31/74 TIME FRAME: 1634-1707

NOTE: Concurrent IK Data Point Available: X

PILLS AND SENSITIVE PAPER PARTICLE DISTRIBUTION DATA, TURKEY POINT SPRAY MODULE TEST

I	D(LOW) (UM)	D(HI) (UM)	DEL D (UM)	D(CEN) (UM)	P(D) (#/UM-M3)	DEL X/DEL D (UG/UM-M3)	DEL X (UG/M3)	DEL FLUX (UG/M2-SEC)	PARTICLE VEL (M/SEC)
1	10.	30.	20.	20.	1.600E 02	6.702E-01	1.340E 01	6.702E 01	5.000E 00
2	30.	50.	20.	40.	8.900E 01	2.982E 00	5.965E 01	2.982E 02	5.000E 00
3	50.	80.	30.	65.	4.500E 01	6.471E 00	1.941E 02	9.706E 02	5.000E 00
4	80.	110.	30.	95.	1.600E 01	7.183E 00	2.155E 02	1.077E 03	5.000E 00
5	110.	150.	40.	130.	4.000E 00	4.601E 00	1.841E 02	9.203E 02	5.000E 00
6	150.	200.	50.	175.	7.900E-01	2.217E 00	1.108E 02	5.542E 02	5.000E 00
7	200.	250.	50.	225.	1.300E-01	7.753E-01	3.877E 01	1.938E 02	5.000E 00
8	250.	300.	50.	275.	1.800E-02	1.960E-01	9.800E 00	4.900E 01	5.000E 00

X (UG/M3)	DRIFT FLUX (UG/M2-SEC)	MASS MEDIAN DIAMETER (UM)
8.261E 02	4.131E 03	100

BARGE SAMPLING POINT CONDITIONS: T_{wet}/T_{dry} Ranges: 22.5 - 25.5/27.0 - 29.8 °C

Canal Water Temperature: 34.9°C
Wind Speed and Direction Distribution: See Table 28

AMBIENT CONDITIONS: Wind Speed: 18.0 Km/hr ; Wind Direction: ESE ; T_{wet}/T_{dry} = 21.0/27.9 °C

TURKEY POINT ISOKINETIC SAMPLING SUMMARY FOR SPRAY MODULES

IK Tube Position $d/\theta/h$ (m/°/m)	Date, Time	M_{Na} (μg)	M_{Mg} (μg)	V_s (m^3)	$\bar{u}$ (m/s)	$\frac{\bar{C}_{Na}}{C_{Na}}$	$\frac{\bar{C}_{Mg}}{C_{Mg}}$	F^a_{Na} ($\mu g/m^2 \cdot s$)	F^a_{Mg} ($\mu g/m^2 \cdot s$)
20.7/280/4.3	1/30/74, 1700	1,350	163	4.84	2.5	1.09	1.07	760	90
36.6/270/4.3	1/31/74, 1620	2,295	234	5.65	4.0	1.09	1.07	1,771	177
41.1/270/7.9	2/01/74, 1544	910	114	7.90	3.0	1.08	1.06	373	46
64.0/245/4.6	2/13/74, 1430	448	53.7	4.59	3.0	1.32	1.24	387	44
41.1/270/4.6	2/13/74, 1617	1,138	121	4.21	2.5	1.32	1.24	892	89
41.1/270/7.0	2/13/74, 1725	523	62.2	3.54	2.5	1.32	1.24	488	54
41.1/270/2.4	2/13/74, 1810	658	78.7	3.38	2.5	1.32	1.24	642	72
88.4/245/4.6	2/14/74, 1637	1,398	104	13.25	3.2	1.02	1.0	344	25
33.5/270/4.6	2/15/74, 1359	574	610	17.82	3.0	1.13	0.94	109	97
36.6/230/11.0	3/18/74, 1653	454	48	10.25	4.8	0.82	0.88	174	20
36.6/230/7.6	3/18/74, 1743	749	92.5	7.09	4.3	0.82	0.88	372	49
36.6/240/4.6	3/19/74, 1122	1,888	202	9.35	4.5	0.82	0.88	745	86
36.6/290/4.6	3/26/74, 1104	2,339	250	5.77	3.7	0.84	0.84	1,260	135
36.6/290/3.0	3/26/74, 1200	2,689	280	3.35	2.9	0.84	0.84	1,955	204
36.6/290/6.1	3/26/74, 1255	1,588	160	4.55	3.8	0.84	0.84	1,114	112
36.6/290/9.1	3/26/74, 1352	439	47.5	5.86	3.9	0.84	0.84	245	27
36.6/275/4.6	3/27/74, 1542	1,914	208	4.10	3.3	0.84	0.84	1,294	141
73.2/280/4.6	3/27/74, 1652	663	70	4.96	2.8	0.84	0.84	314	33
73.2/280/7.6	3/27/74, 1801	138	16	2.73	2.8	0.84	0.84	119	14
36.6/060/4.6	3/30/74, 1540	12,739	1,185	12.79	5.2	0.84	0.84	4,351	405
73.2/070/7.6	3/30/74, 1640	2,839	310	11.71	6.1	0.84	0.84	1,242	136

TURKEY POINT ISOKINETIC SAMPLING SUMMARY FOR SPRAY MODULES (CONTINUED)

IK Tube Position $d/\theta/h$ (m/°/m)	Date, Time	M_{Na} (μg)	M_{Mg} (μg)	V_s (m^3)	$\bar{u}$ (m/s)	$\frac{\bar{C}_{Na}}{C_{Na}}$	$\frac{\bar{C}_{Mg}}{C_{Mg}}$	F^a_{Na} ($\mu g/m^2 \cdot s$)	F^a_{Mg} ($\mu g/m^2 \cdot s$)
73.2/070/11.0	3/30/74, 1755	1,014	111	12.97	7.1	0.84	0.84	466	51
73.2/070/4.6	3/30/74, 1905	989	111	4.84	5.7	0.84	0.84	978	110
36.6/260/4.6	3/31/74, 1240	2,139	208	4.82	2.9	0.84	0.84	1,081	105
33.5/295/4.6	3/31/74, 1345	1,788	163	6.07	4.7	0.84	0.84	1,163	106
36.6/245/4.6	3/31/74, 1441	939	100	6.67	5.1	0.84	0.84	603	64
33.5/270/4.6	3/31/74, 1538	1,489	150	4.06	4.5	0.84	0.84	1,386	140
36.5/280/7.6	3/31/74, 1634	464	49	5.99	5.0	0.84	0.84	325	34

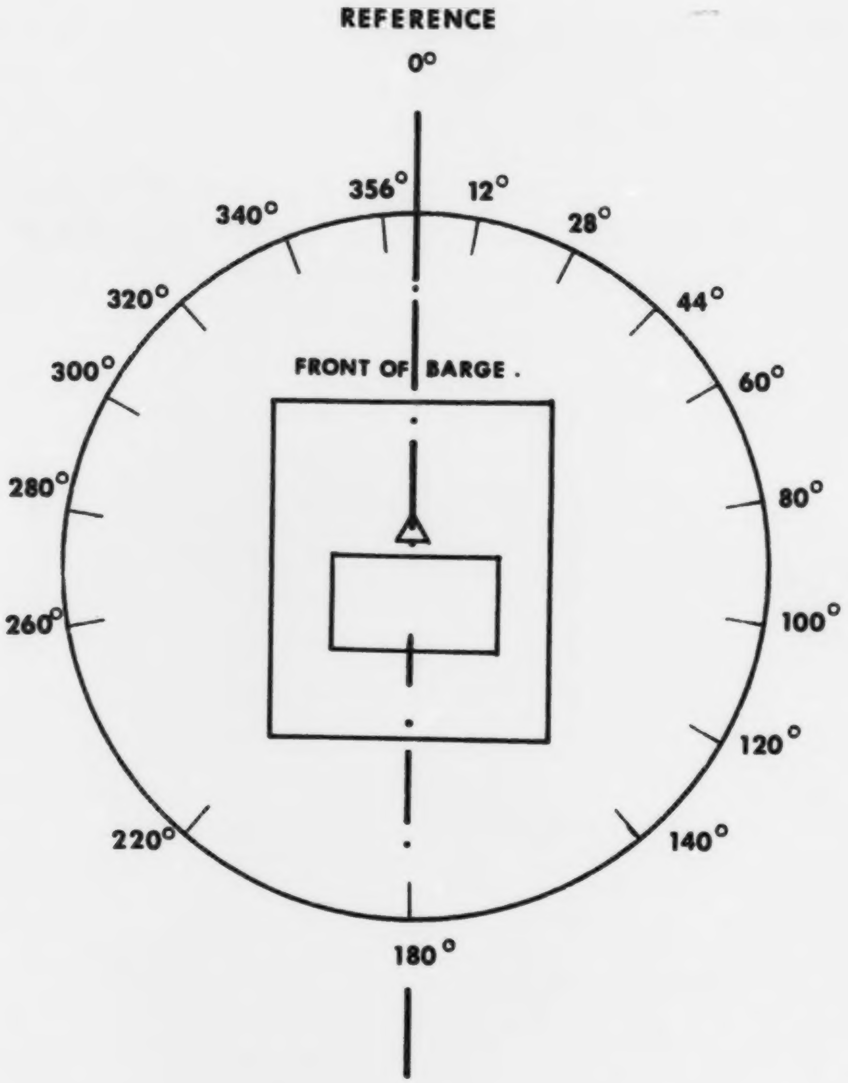


Figure 32. Sectors for wind direction distribution. (Spray Module Test).

Table 9

POSITION: 36.6m/230°/4.6m

DATE: 3/18/74

TIME FRAME: 1459 - 1559

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
		180 - 220	0.0
		220 - 260	0.0
		260 - 280	0.0
		280 - 300	0.0
		300 - 320	0.1
		320 - 340	0.4
		340 - 356	2.3
		356 - 12	12.9
		12 - 28	37.6
		28 - 44	32.4
		44 - 60	11.1
		60 - 80	2.8
		80 - 100	0.3
		100 - 120	0.0
		120 - 140	0.0
		140 - 180	0.0

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 10

POSITION: 36.6m/230°/11.0m

DATE: 3/18/74

TIME FRAME: 1653 - 1723

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
		180 - 220	0.0
		220 - 260	0.0
		260 - 280	0.0
		280 - 300	0.1
		300 - 320	0.0
		320 - 340	0.2
		340 - 356	0.9
		356 - 12	8.3
		12 - 28	55.2
		28 - 44	33.3
		44 - 60	1.7
		60 - 80	0.3
		80 - 100	0.0
		100 - 120	0.0
		120 - 140	0.0
		140 - 180	0.0

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 11

POSITION: 36.6m/230°/7.6m

DATE: 3/18/74

TIME FRAME: 1743 - 1843

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
		180 - 220	0.0
		220 - 260	0.0
		260 - 280	0.0
		280 - 300	0.0
		300 - 320	0.1
		320 - 340	0.1
		340 - 356	0.5
		356 - 12	2.7
		12 - 28	18.6
		28 - 44	55.7
		44 - 60	19.9
		60 - 80	2.0
		80 - 100	0.3
		100 - 120	0.0
		120 - 140	0.0
		140 - 180	0.0

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 12

POSITION: 36.6 m/ 240°/4.6 m

DATE: 3/19/74

TIME FRAME: 1122 - 1222

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
0 - 0.29	0.0	180 - 220	0.0
0.29 - 0.67	0.0	220 - 260	0.0
0.67 - 1.05	0.0	260 - 280	0.0
1.05 - 1.43	0.1	280 - 300	0.0
1.43 - 1.81	0.3	300 - 320	0.0
1.81 - 2.20	0.7	320 - 340	0.1
2.20 - 2.57	1.6	340 - 356	0.5
2.57 - 2.95	4.4	356 - 12	2.0
2.95 - 3.33	8.3	12 - 28	13.2
3.33 - 3.72	11.6	28 - 44	47.5
3.72 - 4.10	14.9	44 - 60	30.8
4.10 - 4.48	17.4	60 - 80	5.6
4.48 - 4.86	15.6	80 - 100	0.3
4.86 - 5.24	10.6	100 - 120	0.0
5.24 - 5.62	7.1	120 - 140	0.0
5.62 - 6.00	7.1	140 - 180	0.0

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 13

POSITION: 36.6m/240°/4.6m

DATE: 3/26/74

TIME FRAME: 1104 - 1148

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
0 - 0.48	0.1		
0.48 - 1.05	0.2		
1.05 - 1.62	2.1		
1.62 - 2.19	6.8		
2.19 - 2.76	15.9		
2.76 - 3.33	26.3		
3.33 - 3.91	17.6		
3.91 - 4.48	10.1		
4.48 - 5.05	11.1		
5.05 - 5.62	4.9		
5.62 - 6.20	3.9		
6.20 - 6.76	0.6		
6.76 - 7.33	0.3		
7.33 - 7.91	0.0		
7.91 - 8.48	0.0		
Greater than 8.48	0.0		

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 14

POSITION: 36.6m/290°/3.0m

DATE: 3/26/74

TIME FRAME: 1200 - 1248

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
0 - 0.48	4.0		
0.48 - 1.05	5.8		
1.05 - 1.62	11.6		
1.62 - 2.19	11.7		
2.19 - 2.76	16.6		
2.76 - 3.33	25.4		
3.33 - 3.91	11.3		
3.91 - 4.48	5.5		
4.48 - 5.05	5.1		
5.05 - 5.62	1.6		
5.62 - 6.20	1.0		
6.20 - 6.76	0.2		
6.76 - 7.33	0.1		
7.33 - 7.91	0.0		
7.91 - 8.48	0.0		
Greater than 8.48	0.0		

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 15

POSITION: 36.6m/290°/6.1m

DATE: 3/26/74

TIME FRAME: 1255 - 1339

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
0 - 0.48	1.2		
0.48 - 1.05	2.2		
1.05 - 1.62	5.2		
1.62 - 2.19	5.0		
2.19 - 2.76	6.4		
2.76 - 3.33	21.6		
3.33 - 3.91	13.1		
3.91 - 4.48	10.4		
4.48 - 5.05	13.6		
5.05 - 5.62	8.0		
5.62 - 6.20	9.3		
6.20 - 6.76	2.0		
6.76 - 7.33	1.2		
7.33 - 7.91	0.5		
7.91 - 8.48	0.1		
Greater than 8.48	0.0		

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 16

POSITION: 36.6m/290°/9.1m

DATE: 3/26/74

TIME FRAME: 1352 - 1440

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
0 - 0.48	0.1		
0.48 - 1.05	0.2		
1.05 - 1.62	0.8		
1.62 - 2.19	1.8		
2.19 - 2.76	4.3		
2.76 - 3.33	11.7		
3.33 - 3.91	12.5		
3.91 - 4.48	10.5		
4.48 - 5.05	15.5		
5.05 - 5.62	9.9		
5.62 - 6.20	18.6		
6.20 - 6.76	5.0		
6.76 - 7.33	4.3		
7.33 - 7.91	3.1		
7.91 - 8.48	1.1		
Greater than 8.48	0.6		

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 17

POSITION: 36.6m/275°/4.6m

DATE: 3/27/74

TIME FRAME: 1542 - 1627

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
0 - 0.48	1.9	180 - 220	0.0
0.48 - 1.05	3.3	220 - 260	0.0
1.05 - 1.62	9.9	260 - 280	0.0
1.62 - 2.19	10.6	280 - 300	0.0
2.19 - 2.76	13.2	300 - 320	0.0
2.76 - 3.33	25.9	320 - 340	0.4
3.33 - 3.91	13.3	340 - 356	2.7
3.91 - 4.48	7.5	356 - 12	13.1
4.48 - 5.05	8.3	12 - 28	34.8
5.05 - 5.62	3.1	28 - 44	35.3
5.62 - 6.20	2.4	44 - 60	11.0
6.20 - 6.76	0.3	60 - 80	2.6
6.76 - 7.33	0.2	80 - 100	0.2
7.33 - 7.91	0.0	100 - 120	0.0
7.91 - 8.48	0.0	120 - 140	0.0
Greater than 8.48	0.0	140 - 180	0.0

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 18

POSITION: 73.2m/280°/4.6m

DATE: 3/27/74

TIME FRAME: 1652 - 1740

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
0 - 0.48	5.3	180 - 220	0.0
0.48 - 1.05	7.9	220 - 260	0.0
1.05 - 1.62	14.8	260 - 280	0.0
1.62 - 2.19	9.1	280 - 300	0.0
2.19 - 2.76	11.0	300 - 320	0.0
2.76 - 3.33	26.6	320 - 340	0.0
3.33 - 3.91	10.8	340 - 356	0.1
3.91 - 4.48	6.0	356 - 12	2.3
4.48 - 5.05	6.1	12 - 28	13.5
5.05 - 5.62	1.6	28 - 44	37.0
5.62 - 6.20	0.7	44 - 60	34.4
6.20 - 6.76	0.1	60 - 80	12.1
6.76 - 7.33	0.0	80 - 100	0.6
7.33 - 7.91	0.0	100 - 120	0.0
7.91 - 8.48	0.0	120 - 140	0.0
Greater than 8.48	0.0	140 - 180	0.0

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 19

POSITION: 73.2m/280°/7.6m

DATE: 3/27/74

TIME FRAME: 1801 - 1830

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
0 - 0.48	5.4	180 - 220	0.0
0.48 - 1.05	10.9	220 - 260	0.0
1.05 - 1.62	17.3	260 - 280	0.0
1.62 - 2.19	11.5	280 - 300	0.0
2.19 - 2.76	11.7	300 - 320	0.0
2.76 - 3.33	22.4	320 - 340	0.0
3.33 - 3.91	8.9	340 - 356	0.0
3.91 - 4.48	5.1	356 - 12	1.0
4.48 - 5.05	4.9	12 - 28	4.7
5.05 - 5.62	1.4	28 - 44	23.5
5.62 - 6.20	0.5	44 - 60	36.9
6.20 - 6.76	0.0	60 - 80	29.7
6.76 - 7.33	0.0	80 - 100	4.2
7.33 - 7.91	0.0	100 - 120	0.0
7.91 - 8.48	0.0	120 - 140	0.0
Greater than 8.48	0.0	140 - 180	0.0

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 20

POSITION: 36.6m/60°/4.6m

DATE: 3/30/74

TIME FRAME: 1540 - 1625

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
0 - 0.67	0.0	180 - 220	0.0
0.67 - 1.43	0.0	220 - 260	0.0
1.43 - 2.19	1.4	260 - 280	0.0
2.19 - 2.95	5.2	280 - 300	0.0
2.95 - 3.72	12.4	300 - 320	0.0
3.72 - 4.48	14.3	320 - 340	0.6
4.48 - 5.24	15.7	340 - 356	3.2
5.24 - 6.00	14.5	356 - 12	15.6
6.00 - 6.76	13.9	12 - 28	34.8
6.76 - 7.53	7.5	28 - 44	30.7
7.53 - 8.29	6.5	44 - 60	11.9
8.29 - 9.05	3.8	60 - 80	2.9
9.05 - 9.81	2.8	80 - 100	0.2
9.81 - 10.57	0.9	100 - 120	0.0
10.57 - 11.34	0.6	120 - 140	0.0
11.34 - 13.43	0.4	140 - 180	0.0

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 21

POSITION: 73.2m/70°/7.6m

DATE: 3/30/74

TIME FRAME: 1640 - 1740

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
0 - 0.67	0.0	180 - 220	0.0
0.67 - 1.43	0.0	220 - 260	0.0
1.43 - 2.19	0.0	260 - 280	0.0
2.19 - 2.95	0.3	280 - 300	0.0
2.95 - 3.72	2.9	300 - 320	0.0
3.72 - 4.48	7.7	320 - 340	0.0
4.48 - 5.24	14.6	340 - 356	0.5
5.24 - 6.00	17.4	356 - 12	8.0
6.00 - 6.76	18.1	12 - 28	36.5
6.76 - 7.53	12.3	28 - 44	41.8
7.53 - 8.29	10.0	44 - 60	10.9
8.29 - 9.05	6.6	60 - 80	2.0
9.05 - 9.81	5.2	80 - 100	0.2
9.81 - 10.57	2.2	100 - 120	0.0
10.57 - 11.34	1.4	120 - 140	0.0
11.34 - 13.43	1.2	140 - 180	0.0

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 22

POSITION: 73.2m/70°/11.0m

DATE: 3/30/74

TIME FRAME: 1755 - 1855

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	**% of Run Time in Range***	**Wind Direction Sectors (°)**	**% of Run Time in Sector***
0 - 0.67	0.0	180 - 220	0.0
0.67 - 1.43	0.0	220 - 260	0.0
1.43 - 2.19	0.0	260 - 280	0.0
2.19 - 2.95	0.1	280 - 300	0.0
2.95 - 3.72	0.3	300 - 320	0.0
3.72 - 4.48	1.9	320 - 340	0.1
4.48 - 5.24	5.6	340 - 356	0.4
5.24 - 6.00	10.5	356 - 12	5.7
6.00 - 6.76	15.0	12 - 28	36.8
6.76 - 7.53	18.0	28 - 44	48.3
7.53 - 8.29	17.8	44 - 60	7.9
8.29 - 9.05	13.3	60 - 80	0.6
9.05 - 9.81	9.0	80 - 100	0.0
9.81 - 10.57	4.6	100 - 120	0.0
10.57 - 11.34	2.5	120 - 140	0.0
11.34 - 13.43	1.5	140 - 180	0.0

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 23

POSITION: 73.2m/70°/4.6m

DATE: 3/30/74

TIME FRAME: 1905 - 1935

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
0 - 0.67	0.0	180 - 220	0.0
0.67 - 1.43	0.1	220 - 260	0.0
1.43 - 2.19	0.5	260 - 280	0.0
2.19 - 2.95	6.4	280 - 300	0.0
2.95 - 3.72	22.4	300 - 320	0.0
3.72 - 4.48	27.0	320 - 340	0.1
4.48 - 5.24	21.7	340 - 356	1.5
5.24 - 6.00	12.8	356 - 12	10.2
6.00 - 6.76	6.0	12 - 28	30.1
6.76 - 7.53	2.3	28 - 44	41.2
7.53 - 8.29	0.6	44 - 60	13.5
8.29 - 9.05	0.1	60 - 80	2.8
9.05 - 9.81	0.0	80 - 100	0.5
9.81 - 10.57	0.0	100 - 120	0.1
10.57 - 11.34	0.0	120 - 140	0.0
11.34 - 13.43	0.0	140 - 180	0.0

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 24

POSITION: 36.6m/260°/4.6m

DATE: 3/31/74

TIME FRAME: 1240 - 1325

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	**% of Run Time in Range***	**Wind Direction Sectors (°)**	**% of Run Time in Sector***
0 - 0.67	0.0	180 - 220	0.0
0.67 - 1.43	0.4	220 - 260	0.0
1.43 - 2.19	7.9	260 - 280	0.0
2.19 - 2.95	21.1	280 - 300	0.0
2.95 - 3.72	28.2	300 - 320	0.1
3.72 - 4.48	24.3	320 - 340	0.8
4.48 - 5.24	14.0	340 - 356	3.9
5.24 - 6.00	3.8	356 - 12	13.8
6.00 - 6.76	0.4	12 - 28	24.5
6.76 - 7.53	0.0	28 - 44	33.6
7.53 - 8.29	0.0	44 - 60	19.0
8.29 - 9.05	0.0	60 - 80	4.1
9.05 - 9.81	0.0	80 - 100	0.3
9.81 - 10.57	0.0	100 - 120	0.0
10.57 - 11.34	0.0	120 - 140	0.0
11.34 - 13.43	0.0	140 - 180	0.0

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 25

POSITION: 33.5m/295°/4.6m

DATE: 3/31/74

TIME FRAME: 1345 - 1428

WIND SPEED DISTRIBUTION		**WIND DIRECTION DISTRIBUTION**	
Wind Speed Ranges (m/s)	**% of Run Time in Range***	**Wind Direction Sectors (°)**	**% of Run Time in Sector***
0 - 0.67	0.0	180 - 220	0.0
0.67 - 1.43	0.0	220 - 260	0.0
1.43 - 2.19	0.4	260 - 280	0.0
2.19 - 2.95	5.4	280 - 300	0.0
2.95 - 3.72	14.9	300 - 320	0.0
3.72 - 4.48	24.1	320 - 340	0.5
4.48 - 5.24	26.8	340 - 356	5.1
5.24 - 6.00	19.1	356 - 12	30.7
6.00 - 6.76	7.4	12 - 28	37.2
6.76 - 7.53	1.8	28 - 44	18.8
7.53 - 8.29	0.2	44 - 60	6.3
8.29 - 9.05	0.0	60 - 80	1.2
9.05 - 9.81	0.0	80 - 100	0.1
9.81 - 10.57	0.0	100 - 120	0.0
10.57 - 11.34	0.0	120 - 140	0.0
11.34 - 13.43	0.0	140 - 180	0.0

***All percentages have been rounded to the nearest tenth, so totals may no* be exactly 100.0%.**

Table 26

POSITION: 36.6m/245°/4.6

DATE: 3/31/74

TIME FRAME: 1441 - 1524

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
0 - 0.67	0.0	180 - 220	0.0
0.67 - 1.43	0.0	220 - 260	0.0
1.43 - 2.19	0.0	260 - 280	0.0
2.19 - 2.95	0.6	280 - 300	0.0
2.95 - 3.72	7.1	300 - 320	0.0
3.72 - 4.48	24.0	320 - 340	0.0
4.48 - 5.24	35.4	340 - 356	0.1
5.24 - 6.00	26.2	356 - 12	1.0
6.00 - 6.76	6.0	12 - 28	12.1
6.76 - 7.53	0.7	28 - 44	61.1
7.53 - 8.29	0.0	44 - 60	24.3
8.29 - 9.05	0.0	60 - 80	1.3
9.05 - 9.81	0.0	80 - 100	0.0
9.81 - 10.57	0.0	100 - 120	0.0
10.57 - 11.34	0.0	120 - 140	0.0
11.34 - 13.43	0.0	140 - 180	0.0

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 27

POSITION: 33.5m/270°/4.6m

DATE: 3/31/74

TIME FRAME: 1538 - 1622

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
0 - 0.67	0.0	180 - 220	0.0
0.67 - 1.43	0.1	220 - 260	0.0
1.43 - 2.19	1.1	260 - 280	0.0
2.19 - 2.95	4.7	280 - 300	0.0
2.95 - 3.72	14.0	300 - 320	0.0
3.72 - 4.48	28.4	320 - 340	0.3
4.48 - 5.24	31.1	340 - 356	1.1
5.24 - 6.00	16.4	356 - 12	4.4
6.00 - 6.76	3.9	12 - 28	19.6
6.76 - 7.53	0.3	28 - 44	52.3
7.53 - 8.29	0.0	44 - 60	18.9
8.29 - 9.05	0.0	60 - 80	3.3
9.05 - 9.81	0.0	80 - 100	0.1
9.81 - 10.57	0.0	100 - 120	0.0
10.57 - 11.34	0.0	120 - 140	0.0
11.34 - 13.43	0.0	140 - 180	0.0

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

Table 28

POSITION: 36.5m/280°/7.6m

DATE: 3/31/74

TIME FRAME: 1634 - 1707

WIND SPEED DISTRIBUTION		WIND DIRECTION DISTRIBUTION	
Wind Speed Ranges (m/s)	% of Run Time in Range*	Wind Direction Sectors (°)	% of Run Time in Sector*
0 - 0.67	0.0	180 - 220	0.0
0.67 - 1.43	0.0	220 - 260	0.0
1.43 - 2.19	0.5	260 - 280	0.0
2.19 - 2.95	1.7	280 - 300	0.0
2.95 - 3.72	8.2	300 - 320	0.0
3.72 - 4.48	20.4	320 - 340	0.2
4.48 - 5.24	35.5	340 - 356	0.5
5.24 - 6.00	25.6	356 - 12	3.1
6.00 - 6.76	6.6	12 - 28	16.8
6.76 - 7.53	1.2	28 - 44	55.1
7.53 - 8.29	0.1	44 - 60	21.0
8.29 - 9.05	0.0	60 - 80	3.0
9.05 - 9.81	0.0	80 - 100	0.2
9.81 - 10.57	0.0	100 - 120	0.0
10.57 - 11.34	0.0	120 - 140	0.0
11.34 - 13.43	0.0	140 - 180	0.0

*All percentages have been rounded to the nearest tenth, so totals may not be exactly 100.0%.

APPENDIX H

MANUFACTURER'S SPECIFICATIONS FOR COOLING DEVICES

H-1 Marley 600/700 One Cell Wet Mechanical Draft Cooling Tower

H-2 Ceramic Cooling Tower Company's Powered Spray Module

APPENDIX H-1

MARLEY 600/700 ONE CELL WET MECHANICAL DRAFT COOLING TOWER: specifications as provided by the manufacturer.

ENVIRONMENTAL SYSTEMS CORPORATION

POST OFFICE BOX 2525
KNOXVILLE, TENNESSEE 37901

(615) 573-7931

November 5, 1974

Mr. J. D. Holmberg
Supervisory Consultant
Engineering Division Office
The Marley Company
5800 Foxridge Drive
Mission, Kansas 66202

Dear Joyce:

Following up on our telephone conversation, I am sending you a list of data that I feel we need in order to document properly the Turkey Point cooling tower in the final report of the Turkey Point contract. Time did not permit us to discuss at any length how The Marley Company could assist Environmental Systems Corporation (ESC) in this matter. I, therefore, will outline here how I would like to see the tower documented, and I will contact you later to receive your comments.

1. General description of the cooling tower:
   Usual and unusual features of the tower, materials, reason(s) for different materials, etc.

2. Dimensions of the tower:
   Length, width, height, stack dimensions, fan diameter, etc. Two drawings showing a schematic top and side view of the tower similar to Marley's drawing #72-41528 should be part of this section. Since metric units are required by contract, I suggest the use of both metric and British units in all drawings and tables.

3. Fill dimensions:
   Length, width, height, vertical and horizontal spacing of the splash bars, etc.

4. Performance data:
   L, G. L/G, range, approach, all at design wet bulb temperature, horse power of fan motor, tower performance curves, etc.

5. Drift eliminator characterization:
   Type of drift eliminators, dimensions, material, performance data, etc.

Mr. J. D. Holmberg
November 5, 1974
Page 2

There may be other items that should be included. Please feel free to expand this suggested documentation in any way you feel necessary.

I believe that The Marley Company would do the best job in describing a Marley cooling tower and I would therefore prefer that a concise description, including the drawings, be furnished by The Marley Company. If this is acceptable to you, we should arrive at an outline and the format by telephone communication. If The Marley Company would rather not become involved, I still need a letter which states the usual and unusual features of the tower, as it was agreed between Messrs. Kadel and Margetts, according to my understanding. Moreover, I hope that The Marley Company would supply me with the necessary information to document the cooling tower sufficiently.

Since I foresee only a volume of several pages, I hope that this task can be conveniently finished within the next two weeks. I enjoyed talking with you and look forward to working closely with you in the near future.

Sincerely,

Gunter

Gunter O. Schrecker, Head
Atmospheric Transport Section

GOS:sr

MARLEY

ENGINEERING DIVISION OFFICE
JOE BEN DICKEY, JR. VICE PRESIDENT
G. W. CANTRELL MANAGER OF OPERATIONS
J. D. HOLMBERG SUPERVISORY CONSULTANT

RECEIVED
DEC 1 3 1974
ENVIRONMENTAL SYSTEMS CO.

December 9, 1974

Dr. Gunter O. Schrecker
Environmental Systems Corporation
P. O. Box 2525
Knoxville, Tennessee 37901

Dear Gunter:

Enclosed are several items which we have discussed. Included are calculated data sheets on drift droplet evaporation. These illustrated to us the significantly greater potential for concentration of the smaller drops through evaporation as compared with the larger ones. The solution to the drift droplet evaporation is incorporated in the program with which we calculate drift deposition. As a result, some of the data on the computer printout sheet is irrelevant. The evaporation calculations are based on the approach in Appendix I of Hosler's "Determination of Salt Deposition Rates from Drift from Evaporative Cooling Towers." Use this as you see fit.

Attached to the description of the Turkey Point tower are #2 size reduced prints of two drawings which illustrate the tower. Whether or not you use both of them is your option. I am also sending you the #4 size drawings from which the prints were made. I was advised by the man in charge of our reproduction work that it would be necessary for the person who would be deciding what to do about making prints for the report to have the drawings in hand. Since the drawings were modified especially for use in your report, there is no need for us to retain them or to have them returned.

I hope the Turkey Point tower description is adequate for your needs. Let me know if I can do anything further.

Yours very sincerely,

Joyce
J. D. Holmberg
Supervisory Consultant

JDH:dc

COOLING TOWER DESCRIPTION

The demonstration cooling tower at the Turkey Point Station of Florida Power and Light Company is a one-cell Marley Class 600/700 mechanical draft crossflow tower. Although the Class 600/700 designation indicates that the tower is a hybrid of two designs, the resultant was so conceived that its operating characteristics are typical of a low-drift tower which is technologically and economically feasible. Of paramount importance is the fact that towers with the key components and operating characteristics of the test tower are commercially available.

The tower was designed to meet the joint criteria of the Environmental Protection Agency and of Florida Power and Light Company and its consultants. In addition to having low drift characteristics, the tower was to be constructed of materials which could be expected to withstand concentrated salt water; and it was planned that Florida Power and Light would evaluate it from that standpoint. Since both preservative-treated wood and concrete can be used satisfactorily in a salt water environment, a portion of the tower structure was constructed of wood and the rest of precast concrete. The fill structure and hot water basin on one side of the tower utilized the treated wood components which are common to the Class 600 rectangular wood mechanical draft industrial towers. The fill structure and hot water basin on the other side and the fan deck and plenum structure were constructed of components from Class 700 concrete towers, both mechanical and natural draft.

Although project costs were reduced somewhat by supplier contributions, budgetary considerations limited the size of the tower. The fill height of 24 ft. (7.3 m) is a standard height for industrial towers but 36 ft. (11.0 m) is more typical. However, proper selection of fan size, fan horsepower and air rate, along with maintaining a typical water distribution rate, provides the operating characteristics typical of the taller tower.

The single cell tower has an overall width of 76 ft. (23.2 m) from louver face to louver face at the top. The net length of the air opening at the louver faces is 40 ft. (12.9 m). The height to the fan deck is 26 ft. (8.0 m) above the basin wall, and that to the top of the fan stack is 44 ft. (13.4 m). The 24 ft. (7.3 m) diameter HP-4-8 bladed fan operates in an 18 ft. (5.5 m) high GRP (glass-reinforced polyester) evase (velocity recovery) fan stack.

The fill consists of corrugated ACB (asbestos cement board) splashbars supported by GRP grids and aligned parallel to the horizontal flow of air. Air travel through the fill measures 16 ft. (4.9 m) on each side of the tower. This is the standard air travel on mechanical draft Class 600 towers, but it may be exceeded in some cases and may increase to as much as 26 ft. (7.9 m) on natural draft towers. The splashbars are placed 4 1/2 inches (.11 m) apart horizontally and 12 inches (.31 m) vertically. This fill configuration has been a commonly-used arrangement for both mechanical and natural draft towers, although there are other arrangements of corrugated ACB splashbar fill to help cover the range of cooling duties. All have similar drift-generating characteristics.

Since the tower was to operate on a sidestream taken from the feeder canal for the cooling canal system, no attempt was made to specify a design condition or to require a specific performance guarantee. Instead the tower was to be sized to accommodate 20,000 gpm (4542 m^3/hr) and to provide representative water-air interaction. Measurements taken on the tower following construction showed actual water flow rate of 19,000 gpm (4315 m^3/hr) to the tower. Later measurements indicate that this had decreased to 15,500 gpm (3520 m^3/hr) by mid-summer of 1974. These two flow rates will be used in conjunction with other coincidental measurements to present some specific thermal performance predictions at actual operating conditions.

The fan was pitched to deliver 997,000 cfm (470.6 m^3/sec) of air. The resultant velocity through the fill is 519 fpm (2.6 m/sec). The corresponding fan motor horsepower is 114.4, and the mass air flow is 72,090 lb./min. (545 kg/sec). For an equivalent air rate in a tower with 36 ft. (11.0 m) of fill height, on which a 28 ft. (8.5 m) diameter fan would be used, approximately 175 hp would be required. Most mechanical draft towers for power plants have air velocities in the range of 450 to 550 fpm (2.3-2.8 m/sec), and the horsepower per 28 ft. fan usually falls between 150 and 200.

With 19,000 gpm to the tower, water is distributed over the fill at a rate of 14.84 gpm/ft.^{2} (36.3 m^3/m^2-hr). Water loadings typically range between 8 and 16 gpm/ft.^{2} (19.6-39.1 m^3/m^2-hr). The L/G (liquid to gas,lb. of water to lb. of air) ratio of 2.20 becomes 1.47 when adjusted to a 36 ft. fill height while maintaining the same air velocity. L/G ratios for power plant towers almost universally fall within the limits of 1.2 and 1.8.

Because of manner in which the tower is being used, it cannot achieve an equilibrium condition in which it dissipates a specific heat load. Instead it must accept hot water at the temperature in the feeder canal and cool it to whatever extent it is capable using the existing ambient air. In the table which follows, predictions of R (range, the difference between hot and cold water temperatures) and A (approach, the difference between cold water and wet bulb temperature of the ambient air) have been listed for some actual operating conditions which existed during the drift measurement tests. Three of the cases presented were taken from the February, 1974, data reported by ESC. The average of the predicted temperatures for the cases agreed with the actual measured temperatures, and the individual test readings differed from the predictions by no more than 0.7°F (0.4°C). Information is not available for making a similar comparison of the summer data.

Table I - Predicted Thermal Performance

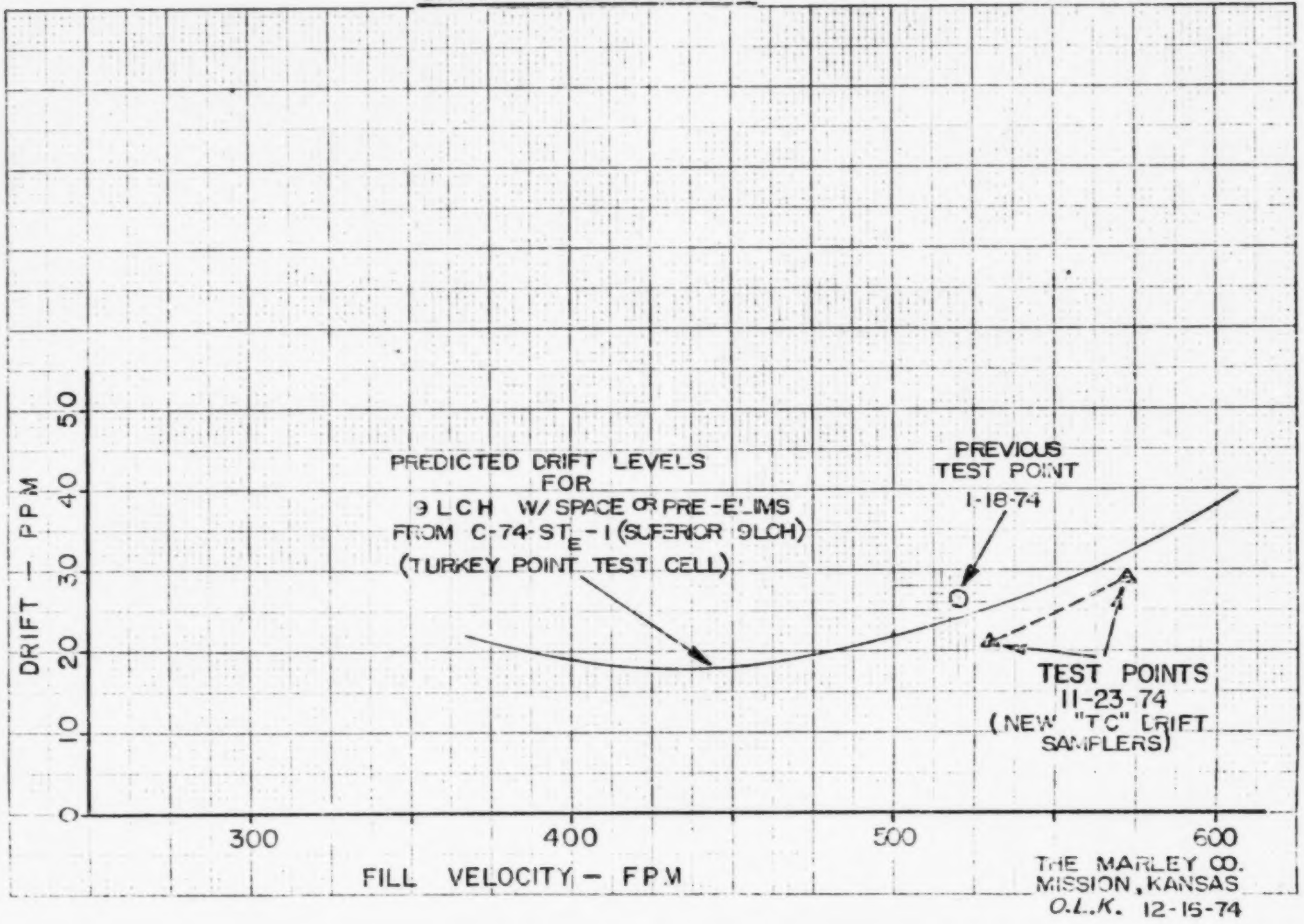
Date & Hour	Water Rate gpm (m^3/hr)	Hot Water Temp. °F (°C)	Wet Bulb Temp. °F (°C)	Predicted R °F (°C)	Predicted A °F (°C)
2/23/74 1615	19,000 (4315)	96.6 (35.9)	68.2 (20.1)	10.2 (5.7)	18.2 (10.1)
2/26/74 1724	19,000 (4315)	85.5 (29.7)	45.0 (7.2)	10.8 (6.0)	29.7 (16.5)
2/28/74 1656	19,000 (4315)	81.5 (27.5)	59.5 (15.3)	6.5 (3.6)	15.5 (8.6)
7/20/74 1500	15,500 (3520)	108.5 (42.5)	75.0 (23.9)	15.8 (8.8)	17.7 (9.8)
7/24/74 1616	15,500 (3520)	110.0 (43.3)	79.0 (26.1)	15.3 (8.5)	15.7 (8.7)

The drift eliminators are oriented in sloped planes as is the practice for rectangular mechanical draft crossflow towers. The same eliminators have been, and are being, used in vertical planes in hyperbolic and circular mechanical draft crossflow towers. They are identified as 9LCH (LCH stands for long cell honeycomb) eliminators and are made up of a system of panels containing a series of angular, upwardly-sloped cellular passages. The panels measure 9.65 inches (.25 m) face-to-face and are constructed of neoprene-asbestos sheets, combining flat and obliquely-formed corrugated sheets to form the passages and provide structural stability. The sheets have been impregnated with a plastic formulation and cured to strengthen and rigidize them.

The 9LCH eliminator is approximately one order of magnitude (ten times) more effective than the herringbone eliminator, which is the standard for this type of tower. The improvement is primarily attributable to the increased efficiency in the removal of the larger drops of water. As a result, the remaining drift is made up predominantly of smaller drops which are difficult to detect and measure. These eliminators allow the use of air velocities of up to 600 fpm (3.0 m/sec.) without increasing the concentration of drift in the effluent air by a factor of more than 2 over the minimum obtainable. See the curve of predicted drift levels, Curve #3. This characteristic was established by tests in a large laboratory test cell, and confirming results were obtained from field tests, part of them near the upper end of the air velocity range. The 9LCH eliminator, either sloped or vertical, shares the low pressure-drop characteristic of the standard herringbone eliminator with none of them exceeding .03 inches (.76 mm) of water at 400 fpm (2.0 m/sec.) air velocity. On the Turkey Point tower, the use of the 9LCH eliminator increases the overall pressure drop slightly, increasing the power to drive the fan by about one horsepower in order to maintain the same air rate as with the herringbone eliminator.

NO. [illegible] 10 DIVISIONS PER INCH BOTH WAYS. 5TH AND 10TH LINES ACCENTED. 110 X 160 DIVISIONS. CODEX GRAPH PAPER IN STOCK DIRECT FROM CODEX BOOK CO., NORWOOD, MASS. [illegible] PRINTED IN U.S.A.

DRIFT MEASUREMENTS CURVE #3



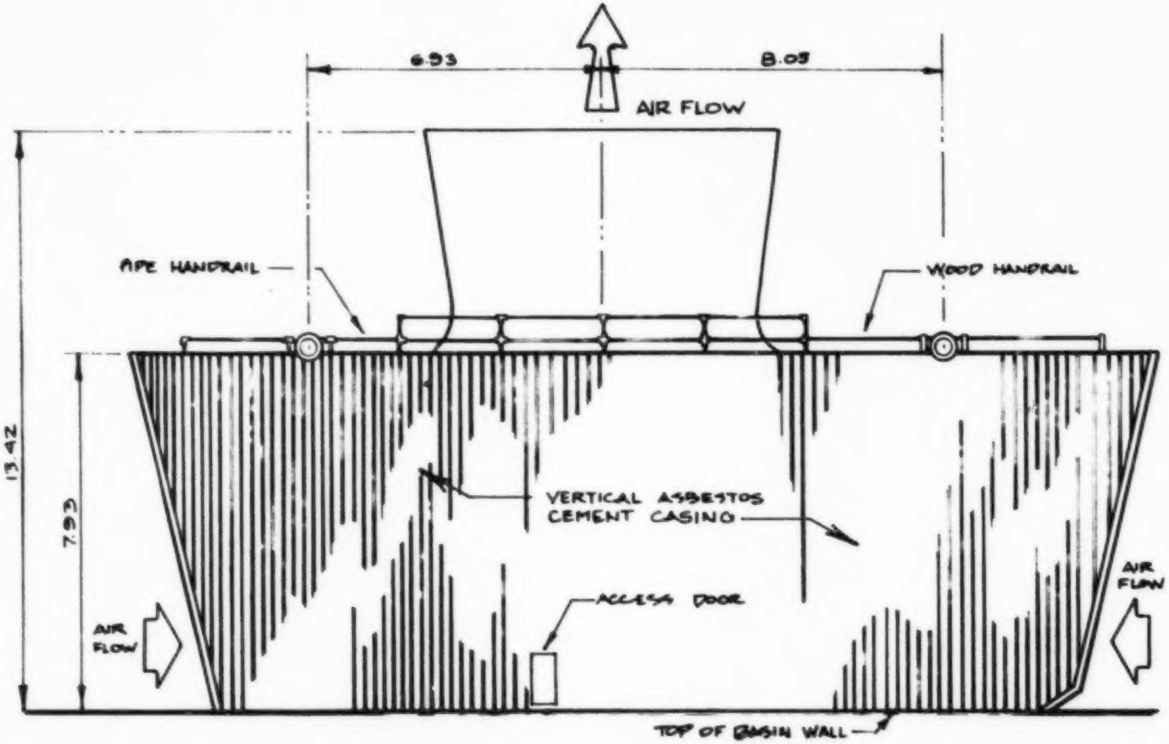


Figure 33. The Marley Company's class 600/700 mechanical draft crossflow cooling tower. Dimensions in meters. (Courtesy of The Marley Company; drawing reduced by Environmental Systems Corporation).

The Marley Company would like to acknowledge the following contributing suppliers to the Turkey Point cooling tower:

Bonnington Lumber Company
Oakland, California

R. B. & W. Bolt
Mentor, Ohio

Special-T Metals
Kansas City, Kansas

Structurlite Plastics
Hebron, Ohio

GAF Corporation
St. Louis, Missouri

Owens Corning Fiberglas Corporation
Toledo, Ohio

APPENDIX H-2

CERAMIC COOLING TOWER POWERED SPRAY MODULE: specifications as provided by the manufacturer.

ENVIRONMENTAL SYSTEMS CORPORATION

POST OFFICE BOX 2525
KNOXVILLE, TENNESSEE 37901

(615) 637-4741

November 5, 1974

Mr. Paul Frohwerk
Ceramic Cooling Tower Company
P. O. Box 425
Fort Worth, Texas 76101

Dear Paul:

Following up on our telephone conversation, I am sending you a list of data that I feel we need in order to document properly the Powered Spray Modules that are installed at Turkey Point. This documentation will be included in the final report of the Turkey Point contract.

The following outline of the PSM description is tentative and I would appreciate CCT's comments:

1. General description of the Powered Spray Module.
2. Dimensions:
   Two drawings showing a schematic top and side view of the spray module would be most helpful. Since the contract calls for metric units, I suggest that all dimensions be expressed in both metric and British units.
3. Hydraulic and mechanical performance data:
   Electric and brake horsepower, pumping rate, height and diameter of spray patterns, etc.
4. Thermal performance data of the single spray module:

   Rate of heat rejection as a function of wet bulb and hot water temperature and wind speed and direction.

This suggested list of topics, that I feel should be addressed in a PSM documentation, may not be complete. I would appreciate your comments and I will call you back after you have received this letter.

I believe that Ceramic Cooling Tower Company would be most qualified to describe a Powered Spray Module and I therefore prefer that a concise description, including the drawings, be furnished by CCT. If this is acceptable to you, we should arrive at an outline and the format by telephone communication. If CCT would rather not become involved, I hope that I would receive the necessary information from you in order to document the spray module sufficiently.

Since I foresee only a concise description of several pages, I hope this task can be conveniently finished within the next two weeks. That is about the time frame within which you planned to let me know about your comments on the Interim Report. I enjoyed talking with you and look forward to working closely with you in the near future.

Sincerely,

Gunter

Gunter O. Schrecker, Head
Atmospheric Transport Section

GOS:sr

Ceramic Cooling Tower Company
a subsidiary of Justin Industries, Inc.
P. O. Box 425 • Fort Worth, Texas 76101 • 817 335-2474

November 22, 1974

Mr. Gunter O. Schrecker, Head
Atmospheric Transport Section
Environmental Systems Corporation
P. O. Box 2525
Knoxville, Tennessee 37901

SUBJECT: Powered Spray Module
Water Cooling System
Environmental Test Program
Our Ref. PSM-117

Dear Gunter:

We hereby provide information on our Powered Spray Module Water Cooling System as requested and suggested by you in our telephone call several weeks ago, and your November 5, 1974 letter.

Specifically provided are duplicate copies of the following documents and/or data;

1. Drawing 4220, "Assembly Details, Model PSM-4-10-75 (S), Powered Spray Module." This drawing provides essentially the information requested in the second paragraph of your letter and includes in our judgement, all dimensional and arrangement information needed.

2. Form PSM-100-US, Revision B, 11-19-74, "Powered Spray Module, System Unit Specifications, Model PSM-4-10-75 (S)". Data herein included supplies requested documentation relating to Paragraphs 1 and 3 of your letter.

3. Form PSM-117-GI, 1, "General Description of Powered Spray Module". This document has been specifically prepared to comply with requirements set forth in Paragraph 1.

We have not responded to your Paragraph 4, because, as discussed on many occasions, we cannot determine a meaningful course of action in which these data can be presented. Any attempt at expressing heat rejection rate in this limited form would be detrimental to a report in which the overall capability of our Powered Spray Module was being considered. In other words, the subject is extremely complex and of a nature that absolutely precludes a superficial or compromising representation for all heat/mass transfer characteristics involved.

Please advise if there are any questions regarding this transmittal or if we can be of service in any way.

P. A. Frohwerk
Vice President and
Manager PSM Operations

PAF:gz

Attachments: (3)
1. Drawing 4220, "Assembly Details, Model PSM-4-20-75 (S), Powered Spray Module".
2. Form PSM-100-US, Revision B, 11-19-74, "Powered Spray Module, System Unit Specifications, Model PSM-4-10-75 (S)".
3. Form PSM-117-GI, 1, "General Description of Powered Spray Module".

Environmental Systems Corp.
Attn: Mr. Gunter O. Schrecker - Duplicate

cc: Dr. Frank H. Rainwater, Chief
Thermal Pollution Branch
United States Environmental Protection Agency
Pacific Northwest Environmental Research Laboratory
Corvallis, Oregon 97330

Ceramic Cooling Tower Company
a subsidiary of Justin Industries, Inc.
P. O. Box 425 • Fort Worth, Texas 76101 • 817 335-2474

GENERAL DESCRIPTION OF POWERED SPRAY MODULE

The Powered Spray Module (PSM) is an evaporative water spray cooling system adaptable under conditions of generally parallel water flow patterns to channels, ponds, or lakes for more efficient dissipation of heat from plant discharge water. The desired cooling is achieved by a direct air-water contact condition which causes mass and heat transfer from water to air.

The PSM is comprised of a 75 HP electric motor-driven, impeller-type pump and four deflector-type nozzles with submerged interconnecting straight-line piping. The pump and nozzles are supported in the water by means of individual surrounding floats consisting of fiber-reinforced-plastic shells filled with polyurethane foam. Each PSM unit is self-contained and is moored in place by lines attached to anchor points on the bank or in the channel. Flotation eliminates the need for special and expensive basins, foundations, and complex pump-piping installation.

In the operation of an individual PSM unit, hot water is pumped from near the surface of the body of water, down through the underwater interconnecting pipe, and discharged upward through four deflector nozzles. The nozzles develop a coarse spray pattern which is optimized for maximum heat transfer and minimum water loss due to wind drift. A single PSM unit is capable of reducing an initial hot water temperature as much as 20° F. Increased cooling requirements can be met by the installation of additional PSM units. Systems are possible which will handle over one million gallons per minute and reduce the water temperature 20° to 25° F with an approach of the ambient wet bulb temperature as low as 5° F. Infinite control (number of units operated) of a PSM system is possible to achieve maximum plant efficiencies.

Ceramic Cooling Tower Company
a subsidiary of Justin Industries, Inc.
P. O. Box 425 • Fort Worth, Texas 76101 • 817 335-2474

POWERED SPRAY MODULE SYSTEM
UNIT SPECIFICATIONS
MODEL PSM-4-10-75 (S)

I. BASIC COMPONENTS

Each standard PSM-4-10-75 (S) consists of following, which are shipped from sources in individual assemblies or categories:

1. Electric Motor
2. Propeller Type Pump Assembly (assembled and including):
    a. Cast Iron[1] inlet and discharge sections with inner hub and shaft support stem.
    b. Cast stainless steel[4] impeller ring.
    c. Cast stainless steel[5] impeller.
    d. Double row, combination radial-thrust, tapered-roller bearings-with top and bottom grease seals. Bearing design for L-10 life in excess of 200,000 hours.
    e. Water lubricated, lower radial bearing.
    f. Grease fitting and lubricant lines.
    g. Miscellaneous hardware, Type 304[2] stainless steel.
    h. Ductile iron[6] coupling.
    i. Impeller shaft, Type 303[3] stainless steel.
3. Pump-Motor Float Assembly - Structural steel frame encapsulated in expanded-in-place polyurethane foam which is completely sealed by polyester-glass fiber shell. Four stainless steel handling-mooring eyes and electrical power cable clamp included.
4. One lot of four Secondary Floats-Expanded-in-place polyurethane foam completely sealed in polyester-glass fiber shell. Cast iron[1] nozzle adapter with four integral lifting eyes (shipped loose) for each of four nozzle floats.
5. One set of four Spray Deflectors-Cast iron[1] with Type 304[2] stainless steel attaching hardware.
6. One set of four Nozzle-Transition Castings - cast iron[1].
7. One set of fabricated steel pipe 3/16" thick consisting of one center section and two end pieces.
8. One set of bolts nuts and washers - for pipe flange joints, Type 304[2] stainless steel material.

[1] Material conforms to ASTM-A126-C1.B
[2] Material conforms to ASTM-A193-B8 & ASTM-A194-B8.
[3] Material conforms to ASTM-A276-GR303.
[4] Material conforms to ASTM-A296-CF8M (Type 316).
[5] Material conforms to ASTM-A296-CF3M (Type 316L).
[6] Material conforms to ASTM-A536-70 C1. 65-45-12.

POWERED SPRAY MODULE SYSTEM
UNIT SPECIFICATIONS
MODEL PSM-4-10-75 (S)

II. HYDRAULIC AND MECHANICAL PERFORMANCE DATA

	1.	Brake Horsepower per unit	75
	2.	Pumping rate per unit, approximate	10,000 GPM
	3.	Pumping rate per nozzle, approximate	2,500 GPM
A	4.	Approximate height of spray pattern above water level	13 ft. to 17 ft.
A	5.	Approximate individual spray pattern diameter at water level	35 ft. to 40 ft.
	6.	Approximate rectangular surface area at water level, required for one PSM-4-10-75 (S) unit	40' w x 160' lg
	7.	Minimum water depth required	7 ft.

A **Dimensions of spray patterns are shown here for reference only. Larger values are representative for clearance uses, smaller values are for hydraulic and/or environmental assessment. Actual pattern is that required and provided for thermal performance consideration.**

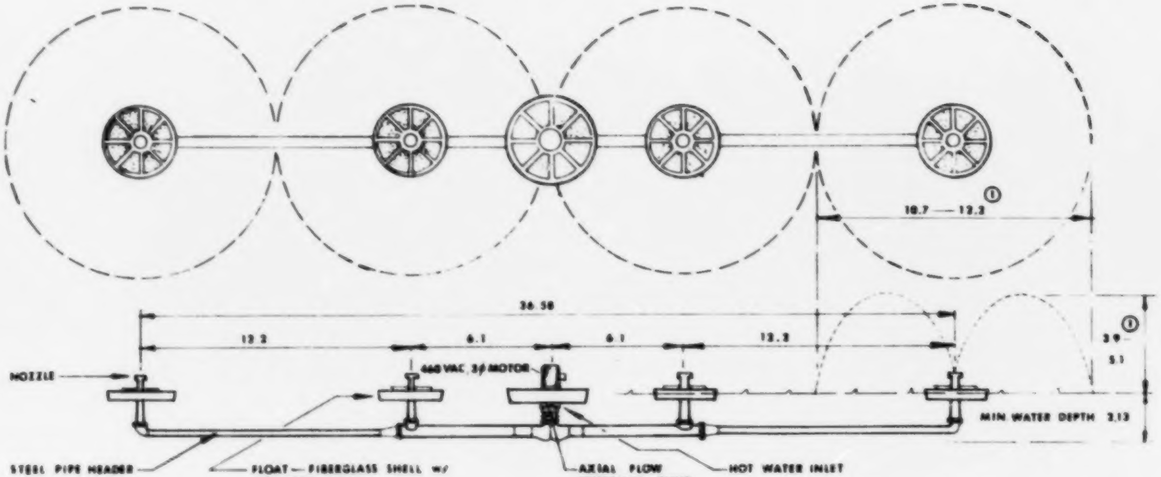


Figure 34 Ceramic Cooling Tower Companys Powered Spray Module (Courtesy of Ceramic Cooling Tower Company, drawing reduced by Environmental Systems Corporation)

NOTE ①
DIMENSIONS OF SPRAY PATTERNS ARE SHOWN HERE FOR REFERENCE ONLY. LARGER VALUES ARE REPRESENTATIVE FOR CLEARANCE USES, SMALLER VALUES ARE FOR HYDRAULIC AND/OR ENVIRONMENTAL ASSESSMENT. ACTUAL PATTERN IS THAT REQUIRED AND PROVIDED FOR THERMAL PERFORMANCE CONSIDERATION

APPENDIX I

STATEMENT OF ACCURACY OF CHEMICAL ANALYSIS BY STEWART LABORATORIES, INC.

Stewart Laboratories, Inc.

5815 MIDDLEBROOK PIKE KNOXVILLE, TENNESSEE 37921

TELEPHONE (615) 588-6401

American Council of Independent Laboratories, Inc.

April 11, 1975

Dr. Gunter Schrecker
Environmental Systems Corporation
Post Office Box 2525
Knoxville, Tennessee 37901

Dear Dr. Schrecker:

The following information is supplied in response to your question concerning the accuracy of analyses performed on samples received from the Turkey Point Project. Wash solutions from APS mesh samples, isokinetic sampling tubes, basin water samples, and deposition water samples from this project were analyzed for sodium by flame emission spectroscopy. Wash solutions from isokinetic sampling tubes and basin water samples were analyzed for magnesium by atomic absorption spectroscopy. The precision of these methods is ± 0.5 percent as established by replicate analysis of certified standards. Analysis ranges for each sample type encountered during the Turkey Point Project are as follows:

Isokinetic Sampling Tubes	Sodium	448 - 24739 micrograms
	Magnesium	47.5 - 2400 micrograms
APS Meshes	Sodium	0.13 - 5242 micrograms
Water Samples	Sodium	0.06 - 8.0 parts per million

Often the analysis of a group of samples requires the establishment of standard curves for several analysis ranges as well as the dilution of samples with higher concentrations. Instruments are recalibrated with freshly made standards each time a group of samples is analyzed. In addition, within a group of analyses, about 13 percent of the results are standards checks. A standard is analyzed after each set of 7 samples.

In order to establish the over-all accuracy of collection, handling, and analysis procedures, it would be necessary to establish a quality assurance program for the three sample types involved in the Turkey Point Project. Such a program would involve the collection and analysis of duplicate samples in addition to the analysis of "blind" samples of known concentration. As you know, no request has been made for a quality assurance program for the Turkey Point Project. We will, however, be most happy to assist in the design of such a program.

Dr. Gunter Schrecker
April 11, 1975
Page Two

Should you receive requests for additional information relating to this project, we will be happy to supply any pertinent data we have available.

Sincerely,

STEWART LABORATORIES, INC.

Barry A. Stephenson, Manager
Administrative Services

BAS:jf

Stewart Laboratories, Inc.

820 TULIP AVENUE — KNOXVILLE, TENNESSEE 37921
615—525-1123

TO: Gunter O. Schrecker

FROM: Anna M. Yoakum

SUBJECT: Special Project Report

DATE: October 15, 1973

OBJECTIVE: To determine sodium contribution from dust trapped on meshes

Two (2) dust samples were analyzed to determine the availability of a "tracer" element in the dust which is not commonly found in the salt atmosphere near salt water. Both dust samples were found to be primarily limestone--$CaCO_3 > 90\%$ (See attached analytical report). Since the control sea water contains approximately 400 ppm calcium and 1350 ppm magnesium, these elements could not be used an an indication of dust contamination. A survey of five (5) exposed mesh samples revealed that only two elements could be used as dust contamination indicators--silicon and aluminum. Aluminum is present in the salt water at a concentration of 0.01 ppm and silicon is found at the 3 ppm level.

The maximum sodium contribution from dust to the five (5) exposed meshes is summarized in Table 1. Calculations are based on the sodium availability from the two dust samples--1855 μg/g for the T.P. feeder canal road by rock pile and 985 μg/g for the T.P. rock pile.

CONCLUSION: There is no significant sodium contribution from dust trapped on the meshes.

TABLE 1. Maximum Sodium Contribution from Dust

SLI Code	ESC Identification	Total Na micrograms	Dust micrograms	Theoretical Na from Dust, μg
9646	T.P. #1 (8-25)	345.	<0.1	<0.01
9647	T.P. #2 (8-25)	600.	10.	0.02
9648	T.P. #3 (8-25)	750.	0.3	<0.01
9649	T.P. #4 (8-25)	902.	<0.1	<0.01
9650	T.P. #5 (8-25)	278.	<0.1	<0.01

Note (attached by ESC):

"ESC Identification" refers to the APS sample head number.

The associated station numbers are as follows:

T. P. #1 - Station 1

T. P. #2 - Station 3

T. P. #3 - Station 4

T. P. #4 - Station 5

T. P. #5 - Station 2

Stewart Laboratories, Inc.
Knoxville, Tennessee 37921

Stewart Laboratories, Inc.

820 TULIP AVENUE · KNOXVILLE, TENNESSEE 37921

CERTIFICATE OF ANALYSIS

TO Dr. Gunter O. Schrecker
Environmental Systems Corporation
Route 3 - Municipal Airport
Alcoa, TN 37701

DATE REPORTED October 15, 1973
CODE: ESC 02707
ORDER No

Sample Description: Two (2) dust samples from Turkey Point

Concentration units are weight percent

	Canal Road	Rock Pile
$CaCO_3$	90.10	93.95
$MgCO_3$	1.32	1.25
SiO_2	7.80	3.70
Al_2O_3	0.24	0.65
TiO_2	0.02	0.02
Sodium	0.22	0.25
Strontium	0.02	0.07
Barium	0.004	0.001
Boron	0.004	<0.001

Sworn to and subscribed before me this 15th day of October 1973

NOTARY PUBLIC

My commission expires January 17, 1976

STEWART LABORATORIES, INC.

By